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ILLUSTRATED FEATURES *Royal State Railways of Siam—Hydraulic Gold Mining in Burma—Hangyang Iron & Steel Works—Philippine Assembly Group—Swatow—Rubber Cultivation.*

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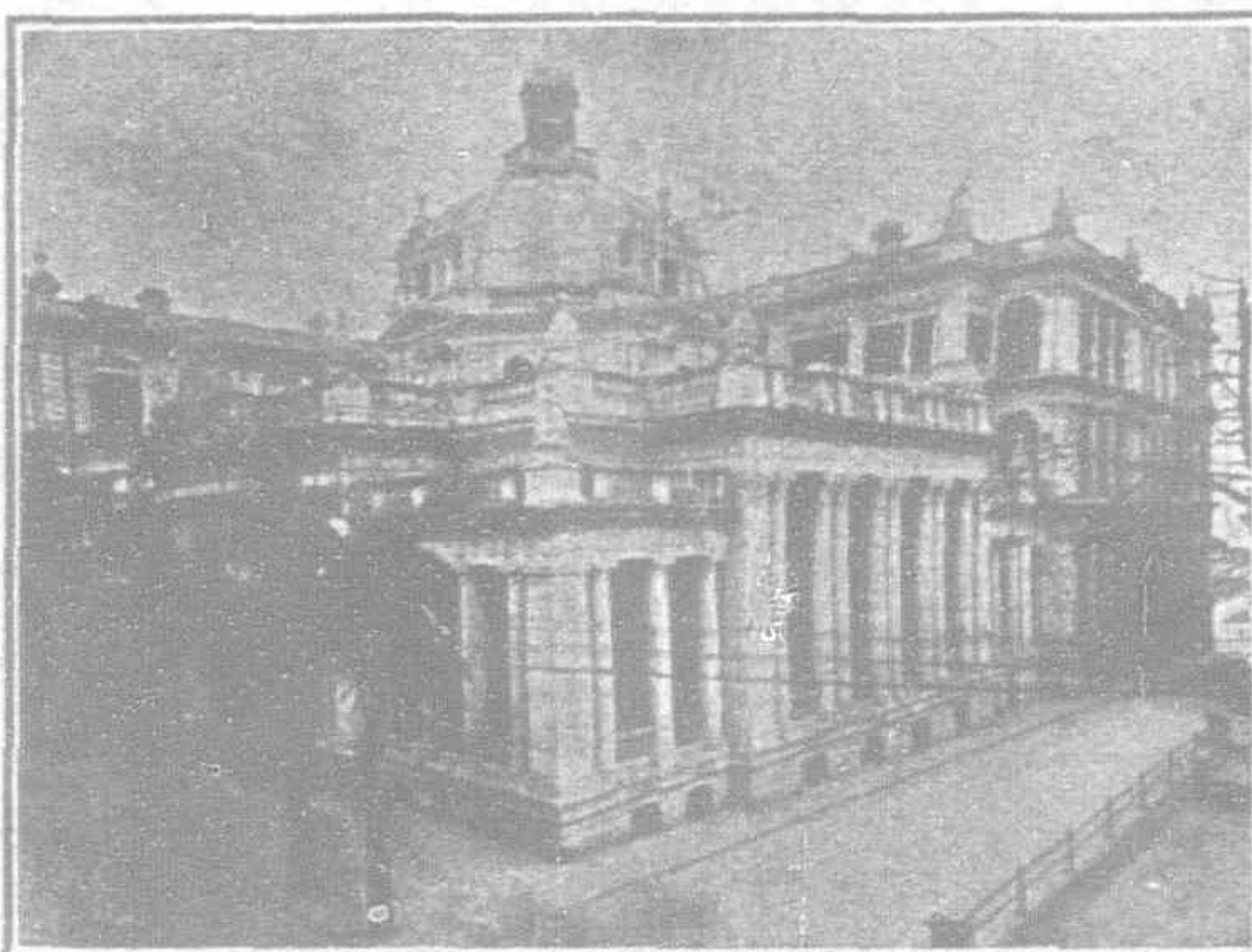
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MANILA, P. I., SHANGHAI, AND YOKOHAMA, JUNE, 1908

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MR. JOHN S. LEECH

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HOME GOVERNMENTS AND COLONIES

When European governments acquire territory in the Far East they call the acquisition a colony just as soon as there are enough nationals settled there to make a comfortable quorum. Sometimes inducements are made to encourage the settlement of the territory, but generally there are sufficient of the youth with red blood and ambition loyally willing to devote their lives to the expansion of empire and incidentally better their fortunes, where brains and energy are more in demand than capital. Now there are different kinds of colonies. Some are self-governing colonies and, in this day and age when a colony is self-governing, there are not many strings tied to the free expression of the wishes of the colonists. A governor-general is appointed as representative of the imperial government so long as he does not make himself obnoxious to the people. Therefore he is usually the right man in the right place, represents the national spirit and is in sympathy with the colonists.

Then there are the Crown Colonies. The government of these latter is generally marked by crass ignorance and less than no consideration for the wishes of the colonists by the Home Government. Recent events in Hongkong have roused the indignation of the British resident and merchant. It appears that, without warning, the Imperial government decided to wipe out the opium trade in the colony without regard to the enormous losses sure to be involved and without consulting the people of Hongkong or even hinting its purpose. Had Hongkong been a city in central Russia the mandate could not have been more arbitrary. The result was that, while the Hongkong merchants are desirous of having reasonable and well-defined measures inaugurated in co-operation with the Peking government for the suppression of the vice, they voiced their protest against the arbitrary order of the Imperial government through the press and in the following resolution of the Committee of the Hongkong Chamber of Commerce:

"The Committee of the Chamber record their strong protest against any arbitrary orders from the Imperial Government to close immediately the opium divans in Hongkong. The Committee of this Chamber is entirely sympathetic towards all reasonable bona-fide efforts for the mitigation of the abuse of opium, but is of the opinion that any action having for its object the immediate suppression of the sale and use of opium in Hongkong will have serious effects on the economic conditions here and lead to disastrous results to the Colony's prosperity unless similar action is enforced in China. It is, therefore, resolved to request the Hongkong Government to inform the Imperial Government that any hasty and ill considered action taken in this matter to the detriment of the interests of this Colony will be generally resented, but that on the other hand a policy of gradual reduction similar in its action to the Imperial Government's agreement with India will be loyally supported."

So far as can be learned at this time, no recognition has been accorded the protest, and judging from former experiences, the prospect is not bright for favorable action, notwithstanding the fact that the Governor of Hongkong seems, in a measure, personally in sympathy with the merchants.

An effort was made by Mr. Murray Stewart, the representative of the Chamber of Commerce on the Hongkong Legislative Council, to have a comprehensive resolution adopted at a recent meeting of that body. Just before submitting the resolution Mr. Stewart gave expression to the following pertinent remarks that reflect the controlling sentiment of the colony:

"In this clear contention I lay claim to speak for the whole mercantile community. I speak with the voice of a community united in protesting against the inconsiderate exercise of arbitrary power.

"The inconsiderate exercise of arbitrary power is not to be tolerated without chal-

lenge even when exercised in the name of the sovereign people. Englishmen are very ready to repose their trust in despotic formulas, but it is always on the understanding that they shall not be used in a high-handed manner. Whenever there is even a show of the abuse of office there is sure to be trouble.

"Every English statesman ought to know this. No English statesman ought to forget it. We in this Colony humbly aspire to remind one of that fact.

"The voice of Hongkong sounds dimly in London. We realise that only too well. We realise only too well that the voice of this Council can hardly hope to sound at all within the walls of Westminster. But it is our duty to uplift it, hoping against hope, and impelled by a sense of that duty I move:—

"That the members of this Council view with concern the action of His Majesty's Secretary of State for the Colonies in issuing an order affecting the revenue of Hongkong without having previously given sufficient notice to the Colonial Government to admit of the matter being referred to this Council; and desire to record a protest against any steps being taken to carry out the order announced in Parliament on the 6th instant, until His Majesty's Government shall have been fully informed of the prospective financial effect and before this Council shall have been called upon to consider the methods by which it is proposed to re-adjust the burden of taxation."

Applause greeted the reading of the resolution and, before a division was taken, His Excellency the Governor took the floor and while expressing his sympathy with the greater part of the sentiment voiced he did not favor any action at least until the receipt from the Secretary of State for the Colonies of a reply to an explanatory cablegram sent to him by the Governor.

Upon a division the vote stood eight to five against the resolution and the complexion of the vote may be gathered by the following:

For: Messrs. Slade, Stewart, Pollock, Wei Yuk and Dr. Ho Kai—(Five).

Against: Sir Henry Berkeley, the Harbor-master, the Registrar-General, Director of Public Works, the Colonial Treasurer, the Attorney-General, the Colonial Secretary, and the Officer Commanding the Forces—(Eight).

Imperial despotism triumphed for the time. So far as we are able to learn the Home Government continues in its former attitude. There were a sufficient number of representatives of the home government at the meeting of the council to smother any local expression, but the principle will not down.

And at this time, as if in sympathy with the local spirit in Hongkong, we hear of the resignation of Senhor Coutinho, the Governor of the Portuguese colony of Macao, for the reason that he could not consistently conform to the pre-emptory orders from Lisbon and at the same time preserve the interests of the colony and do his duty to the colonists. Explanatory of his action, the representative of the *Hongkong Telegraph* writes as coming from authentic official sources:

"As is well known Macao yearly provides a grant-in-aid towards the impoverished exchequer of Timor. The sum is a comparatively large one for Macao. In spite of that the money so far paid out during the current fiscal year has already been more than double of the budget appropriation. Recently an order was received from the home Government directing Governor Coutinho to remit another additional amount which would bring the total up to over three times the original grant. With this peremptory order the Governor declined to comply, and with very good reasons, too. His Excellency stated that the coffers of Macao were not flush with cash. There were reproductive public works in the Colony of urgent necessity for all of which funds were needed to carry out. Public improvements were delayed and not carried out simply because there was no money available, yet all Macao's surplus revenue was drained away to nurse a colony of no benefit to Macao itself. Governor Coutinho, as an emphatic

protest against the arbitrary instructions, tendered his resignation. In taking so dignified a stand against what he considers an injustice to the Colony for whose successful government he is responsible, I make bold to assert, his action will not only be endorsed but justly applauded by all right-thinking citizens of this Colony.

"It is an open secret that, on two or three occasions previously, Governor Coutinho has expressed his desire to relinquish the reins of Government. His administration has been beset by a series of *contretemps* and usual difficulties. The *Tatsu Maru* incident, with all its attendant worries and anxieties, convinced His Excellency that there was something rotten in the State of Denmark. Senhor Coutinho was animated by the best of good intentions to put the house in order, and the fair, just, impartial and righteous man that he is, His Excellency endeavoured to place his administration, like Caesar's wife, above suspicion. Those who had hoped that his clean handed government would have restored to Macao a fair name will regret his departure from the helm at this most critical conjuncture. Senhor Coutinho will sail with his family as soon as arrangements can be completed."

It might be said in this connection that when Governor Coutinho indicated his intention to leave the colony he was given a monster demonstration as an evidence of the high regard in which he is held there.

Here are two instances where the nationals of crown colonies have filed protests against the arbitrary acts of their home governments, one protests without the approval except tentatively and in part of the governor and the other in the most forcible manner by the local executive, who refused to be the tool of the Home Government at Lisbon to work a detriment to the colony whose interests he was presumed to protect and whose enterprise he was pledged to encourage.

And Europe is not alone represented with Crown colonies in the Far East. America has one carefully disguised under a name that is presumed to appeal to the democratic voter in the homeland, but one as despotic, if not more so, than either the Crown Colony of Hongkong or of the Colony of Macao. True the administration at Washington declares that the initial attempt of America to colonize is along a brand new line and one that has for its purpose the sacrifice of every selfish interest in an altruist attempt to educate the native and develop a self governing nation along the most liberal lines. Such a colonizing feature is without precedent and its success depends on the capacity of the natives for government. In the meantime (now ten years have passed in experiment), all foreign and American enterprise must remain in abeyance until the Home Government at Washington gets tired of its missionary effort. The ear of the administration at Washington is more completely and effectively sealed when a protest from the American merchants, or colonists, is anticipated than London or Lisbon under similar circumstances.

Even the virtue of patience, which has some encouragement in Hongkong and Macao, finds none in the vacillating policy of the Washington administration. Hongkong and Macao have the benefit of established foreign policies, that may be relied upon, but America has none in regard to the Philippine Islands. The menace of Native control through the indefinitism of the time when it shall be decided to conclude the experiment in government, has been the greatest drawback to progress in the archipelago.

Hongkong knows that it shall remain a part and parcel of the sturdy British Empire for all time, and Macao has the same assurance as to the attitude of Lisbon, but the American in the Philippines is entertained by the prospect of some day—never definite—of the withdrawal of the American government. And the thought is not pleasantly entertained. Businessmen are prone to prefer government based on experience rather than be made the catspaw of experiment in government. So far as the wishes of the American busi-

nessman are concerned, they are and apparently shall ever be ignored, should they conflict with the political policy of the administration at Washington.

More resignations of governors, who refuse to carry out orders emanating from home governments, that they recognize as unjust, arbitrary and issued without regard to the wishes of those directly affected; more stirring protests similar to the resolution of the Hongkong Chamber of Commerce and the united effort of the combined press of the Far East, which is directly interested and designed to reflect the prevailing sentiment among the colonists, would finally make an impression that would surely awaken a sentiment in the different homelands, looking to better treatment of the pioneers on the firing line of the frontier, who are ever willing to bear their share of the burden of empire without complaint, and who are at least entitled to some consideration by Home Governments when legislative or executive action, directly affecting their interests, is proposed.

It means much sacrifice of official ambition for the sake of principle for the executives who would choose this course and much humiliation and embarrassment for the merchant who takes the initiative in such a campaign, but in the end they would all be honored by their countrymen as men who put principle before self and refused to remain tools of selfish systems that have little in their operations to commend and much to condemn.

THE AGE OF CONCRETE

No community of today that does not utilize concrete in the construction of its public buildings and other public works, may expect history to place it in the vanguard with the most progressive sections of the period. From the use of concrete in its original crude form there are now few features of construction work in which it is not utilized successfully. During the last ten years, engineers and architects have been obliged to take a special course to keep pace with the demand for reinforced concrete construction and there does not seem any limitation to the possibilities along these lines.

The latest and possibly the most novel use of concrete is in shipbuilding. Its possibilities in this direction are apparently unlimited, if we are to judge from the success with which it has been reported utilized by a firm in Rome in the construction of small vessels. The prospect for the more general use in shipbuilding of reinforced concrete in the near future is made the subject for comment by *The Scientific American*. That journal says:

"Strange though this title appears, 'the building material of the future' has actually been employed in shipbuilding. In the first Paris exposition, in 1885, a small boat made of reinforced concrete was exhibited by Lambot. This vessel, which was constructed of wire netting covered with cement, is still afloat and will soon be installed in a technical museum. It was regarded as a mere curiosity, and led to no practical result. In 1896 Gabellini of Rome built an experimental vessel of reinforced concrete, which is still in service on the Tiber and in excellent condition. The same firm has since constructed a large number of concrete vessels, designed chiefly for stationary service as bridge pontoons, for which purpose they are eminently well fitted, owing to their small cost of maintenance, as they need not even be painted. These concrete vessels, however, also include boats used in construction work in water and coal barges and lighters having capacities up to 150 tons.

"The character of the material and the methods of construction employed with it make it possible to build vessels of reinforced concrete of any desired form and dimensions. The frames and longitudinal beams are made of concrete reinforced with round bars of iron, and the skin consists of a single or double layer of concrete stiffened with wire netting, and made perfectly smooth and watertight by an external coat of pure cement.

"Longitudinal and transverse watertight bulkheads, air chambers, etc., can be con-

structed of reinforced concrete in any desired arrangement. Abrasions and other local injuries caused by collisions with piers, etc., are largely prevented by wooden buffers attached to the hull, and those that occur are easily repaired with cement. The boats cost almost nothing for maintenance, are fire proof, and can be constructed almost anywhere. They cost about half as much as iron vessels of the same capacity."

So, while the construction of vessels of reinforced concrete may be said to have passed muster in the initial stage, it is left for experts to specialize along lines tending to perfect the methods employed and to define the limits in this class of construction.

From another source, we learn that cement may play a large part in the preservation of the world's forestry by the novel method of tree dentistry.

"Hardly a day passes nowadays that a new use for Portland cement is not found," says the *Literary Digest*.

"Recently one of the leading railroads replaced wooden telegraph poles by concrete poles, and they are being found more satisfactory from almost every point of view. Reinforced concrete planks are being used in steamboat construction. Wooden ties are being replaced by concrete on some railroads. The infant's milk is obtained in a dairy where the floors, walls, bins, feed mixing troughs and stalls are all of concrete. As he grows older he is surrounded on all sides by concrete structures, and when he dies his body is placed in a grave whose vault is constructed of concrete and a concrete tombstone is used to mark his resting place. Thus the examples of the varied uses of cement might be multiplied. One of the most novel, however, is the use of cement for 'tree dentistry,' which is described in a recent catalog of the Dragon Portland Cement Co. This consists in the filling of old cavities in the trunks of trees with a rich cement mortar, after the rotten wood has been carefully removed, somewhat similar to the manner in which a dentist carefully cleans a tooth cavity before filling. Care should be exercised, however, to see that the surface of the cement is low enough for the bark to grow over it. Foresters believe this will be the means of saving many old trees from further decay and destruction."

From another exchange we learn that the use of reinforced mine-timbers is feasible.

"They have been introduced by D. W. Shepard of Denver, involving a new method of reinforcing by trussed rods. By this system greater resistance is given to lateral strains, increasing the strength of the concrete member in the direction in which its weakness has in the past proved an obstacle to its use. Thus, it is claimed, caps of reinforced concrete may be made having, within less compass and lower cost than ordinary timber, decidedly superior strength. The reinforcing rods employed are of 1/2 in. steel, and the size of post and cap proposed as standard by Mr. Shepard is 4 by 9 in. For permanent shafts and gangways it is conceivable that a system of this kind may present advantages which will commend it to increasing favor among mine managers, on account of the rapidly growing expense of timber and the generally decreasing cost of cement throughout the country as a result of competition."

Reference has also been made from time to time in regard to house heralded as an invention of Thomas A. Edison which is novel only in the matter of the forms in which the house is moulded. "The moulds consist of cast-iron plates less than an inch thick, with milled edges and faces having flanged joints drilled for dowel-pin and bolt connections. The inner surfaces of the plates will be nickel plated or faced with brass where ornamental finish upon the concrete is required. All the details of bearings for reinforcing rods, and ways for plumbing connections and electric wiring, are provided, and the moulds properly numbered for speedy erection. It is proposed to employ steam or electric platform derricks for handling the moulds in erecting

and in taking down. Economy in construction with the Edison system will result only through duplication of the same structure with the same set of moulds. It is estimated that a set for a two-story house of eight rooms will cost less than \$40,000, and that such houses may be built for less than \$2000 with cement at \$1.50 per bbl. Mr. Edison proposes to use a mixture of 1 part cement, 3 parts fine sand, and 5 parts crushed stone or gravel passing a 1/2-in. ring."

And perhaps the most important matter now engaging the attention of engineers is the adaptability of cement for roadbuilding from the point of durability, sanitation and economy. So far as can be learned, its use has met with success in this direction. In the May number of the FAR EASTERN REVIEW we published a letter that should interest every municipal engineer in the Far East. It was written by the city civil engineer of the city of Richmond, Indiana, and affirms that after a period of 12 years an alley paved with concrete showed little signs of wear. The cost was about 18 cents gold a square foot and there has been no cost for repairing. After it was laid, owing to the settlement of gravel around an adjacent hotel, this particular pavement settled, but instead of being disastrous, as in any other class of paving, the effect was simply to make the surface uneven.

The construction of permanent roadways in the Far East has been one of the most difficult problems with which western effort has to wrestle and if cement construction is as feasible as the city engineer of Richmond asserts, the building of highways is no longer a problem.

JOHN S. LEECH, PUBLIC PRINTER OF THE UNITED STATES

"Over in the Philippines they are doing public printing so successfully and so cheaply that it has been suggested that the Central Government at Washington send its work over there to be done. The space intervening has proved such a drawback to this proposition that the next best thing has been done, and John S. Leech, the man who made the Philippine office, is being brought to Washington to do the same things here on a big scale that he has done in the islands in a small way.

"In the archipelago the United States' schedule of payments has been applied to the work of the different bureaus when their printing was to be done, and the profits were so great that the prices were reduced 20 per cent. Even on this scale it has been found necessary to divide up the money left over and give it back to the people for whom the printing was done. Somehow there had been found a way to get out the work economically, and the man who is doing it is to be given the chance to show the home government what it may learn from the insular possessions." — *William Atherton Dupuy in the Washington Times.*

Early in the year 1901, John S. Leech, foreman of the Fifth Division of the Government Printing Office at Washington, D. C., received a "Message to Garcia." It came in the form of an order from the Philippines for a man to plan, assemble, transport to the Philippine Islands and instal there a modernly equipped printing plant of sufficient capacity to handle the work of the newly established government. The request came from Governor Taft through Secretary Root who requested Public Printer Palmer to pick him out a man who would size up to the job. Foreman Leech was recommended. He was selected at once and with the simple information that the Philippine Government wanted him to furnish a plant, he proceeded unaided to deliver the "Message." In eleven months he had delivered the goods in the form of a 300,000 plant and since that date until he was selected by President Roosevelt, last month, to take charge of the \$20,000,000 plant of the United States Government at Washington, he has been in charge and given the islands a demonstration of the greatest possibilities of the printer's craft and his reward is the highest in the gift of the nation for the graduate of the "Cases."

Mr. Leech was born in Bloomington, Ill., in 1869. He began his apprenticeship in the office of The Pantagraph Printing and Stationery Co. of his native town.

After concluding his apprenticeship, he went to Chicago and worked there until he secured a position as printer in the government printing office at Washington, at about the age of 21. He was soon promoted from the "Cases" to the proof room; and later assigned to the press revision on the night force during the sessions of congress. Here he established a record of sending direct to press from first proof, which the craft will appreciate. Under Public Printer Palmer, he was appointed foreman of the famous Fifth Division in which, in conjunction with other work, the day's record of congress was set up and the distribution made of the type set up by the night force. He held this position from 1897 until May 29th, 1901, when he accepted the rather indefinite commission from the Philippine government. His instructions included the organizing of a staff and the purchase of the plant and supplies. Not an estimate was furnished him, nor did he ask for any. As soon as he was given offices in the bureau of Insular Affairs, he selected as his assistants Edwin C. Jones and J. A. Hoggsette, both assistants out of the famous Fifth Division. Mr. Jones to remain with him until he took the "Lone Trail" early last month and Mr. Hoggsette, who succeeds him as Acting Director of the Philippine Bureau.

He at once secured the auditor's report on printing bills paid by the Philippine government for a few years previous, and, with this as a basis, he prepared his plans and specifications, even to the detail of special accents necessary to complete his equipment to handle the Spanish, Tagalog and other Filipino languages. In preparing the "scheme" days of work were involved in reaching an estimate of the proper proportion of accents believed necessary for the work. The schedule when completed included equipment for a composing room, book bindery, electrotyping and stereotyping foundry; a photo-engraving division; press-room division; linotype division; power plant and machine-shop division. Bids were advertised for and in the latter part of 1901, 10,000 cases and a force of 20 men arrived in the harbor of Manila. Messrs. Jones and Hoggsette had arrived previous to the consignment and had selected the site as well as renovated the building to suit the volume of the plant. The installation was completed and the plant opened on June 1st, 1902. Since that time it has been increased to meet the government demands upon it. For instance the linotypes have been increased from four to twelve in the last six years. The plant stands to-day a monument of neatness on the South of the beautiful Botanical Gardens of Manila, every piece of machinery in perfect order and directed by a system that secures the greatest possible results at the least possible cost.

Mr. Leech made a feature of training Filipinos and succeeded so well that upon his promotion there were 353 Filipinos on the pay roll and only twenty American craftsmen, who supervised the different departments. The direction of the plant with American supervising craftsmen over Filipinos trained under them has been a marked success besides turning out skilled craftsmen, able to take charge of commercial offices. Each year there are from 30 to 50 graduates and about 80 apprentices at the cases all the time. Perhaps no other bureau has met with the success in training the young idea in the Philippines and certainly no graduates in any craft or trade have given more general satisfaction.

The fact that he delivered the "Message to Garcia" and brought the Philippine Bureau to the highest state of efficiency and kept it there, attracted the attention of President Roosevelt at a time when the printing bureau at Washington was in a hopeless political and economic muddle, and probably no one was more greatly surprised at the appointment than the recipient.

This promotion means the control of the greatest printing plant in the world and the direction of an army of 3,300 employees operat-

ing in a plant that is valued at about \$20,000,000 U. S. C.

Mr. J. A. Hoggsette, who succeeds Mr. Leech as acting director of the Bureau of Printing, was born in New York City in 1877 and worked out his apprenticeship in the office of Major Davis, the father of Oscar King Davis, in Wahoo, Nebraska, where he started work at the age of 13 years. In 1899 he took the civil service examination and went on the cases in Washington to be later promoted by Foreman Leech as one of his assistants and selected to join his Philippine staff as foreman of printing. He was advanced to the position of superintendent of work, one of the most important in the gift of the director. His home is in Lincoln, Nebraska. Mr. C. E. Wagoner, acting superintendent of work, was promoted to acting assistant director, and Mr. E. E. Gessler to acting superintendent of work.

HONGKONG-MANILA CATTLE TRADE.

The action of Messrs. Jardine, Matheson & Co., Messrs. Shewan Tomes & Co., and Messrs. Butterfield Swire, in protesting not only against the injury done to the export cattle trade of Hongkong by the stuffing and drenching of cattle at the Animal Depot, but against the inhuman method employed to add weight to the animals, has met with the endorsement it deserved, and henceforth the strictest discipline will be maintained against a recurrence of the outrages.

In this connection it might be said that the Philippine Government has been expending millions of dollars in an ineffectual effort to stamp out rinderpest, and the unloading of imported cattle that are either sick and susceptible to disease as a result of the stuffing at Hongkong, did not serve to assist in making this campaign a success.

This attitude on the part of the Philippine Government has no motive but the protection of Philippine stock and there is every reason to believe that satisfactory regulations will be arranged for so that this trade may be encouraged. The action of the Hongkong authorities in promptly suppressing the stuffing process has made a most favorable impression and reflects credit upon the business firms who took the initiative.

MONSTER ORDER FOR AMERICAN STEEL RAILS

The reported offer of John D. Rockefeller to finance the proposed railway extensions in Western Russia, followed by the order placed by the Russian government with the American Steel Trust for one million tons of steel rails, would indicate that American capital will have its share of interest in the development of Siberia. And in passing it might not be foreign to the subject to state that Mr. Rockefeller is not investing his money in response to any sentiment. He has ever been a true prophet in regard to his own investment and it will not surprise anyone familiar with the magnate's career if there should develop a few oil deposits in the vicinity of the proposed lines awaiting the touch of the Standard Oil Wizard to gush forth abundantly.

It is well-known that the competition in the Far Eastern market created by Russian oils has worried the Oil King. This unusual condition of mind, as may be presumed, could not continue indefinitely with Mr. Rockefeller. During his career, competition was the least of his worries. He had a special "half-Nelson" for it in any form, and history confirms his success in utilizing it. Now we may expect an exhibition of his skill in dealing with the Russian brand of competition.

Rockefeller has a keen appreciation of the value of transportation and since there is no interstate commission in Russia, the advantages of rebates may not be denied him, and there is every reason to believe that Mr. Rockefeller is not financiering any Russian railway enterprise unless assured of special privileges of a character that furthers his interests abnormally and at the same time chloroforms all competitors. We shall see what we shall see.

ROYAL STATE RAILWAYS OF SIAM

The opening ceremony of the new railway to Petrieu and the Northern Extension from Paknam Pho on January 24th, last, at which His Majesty the King of Siam presided, was the occasion for an interesting review of the work on the extensions in progress of construction under the direction of the Ministry of Public Works, and contained in the following address read to the King by H. R. H. Prince Naresr:

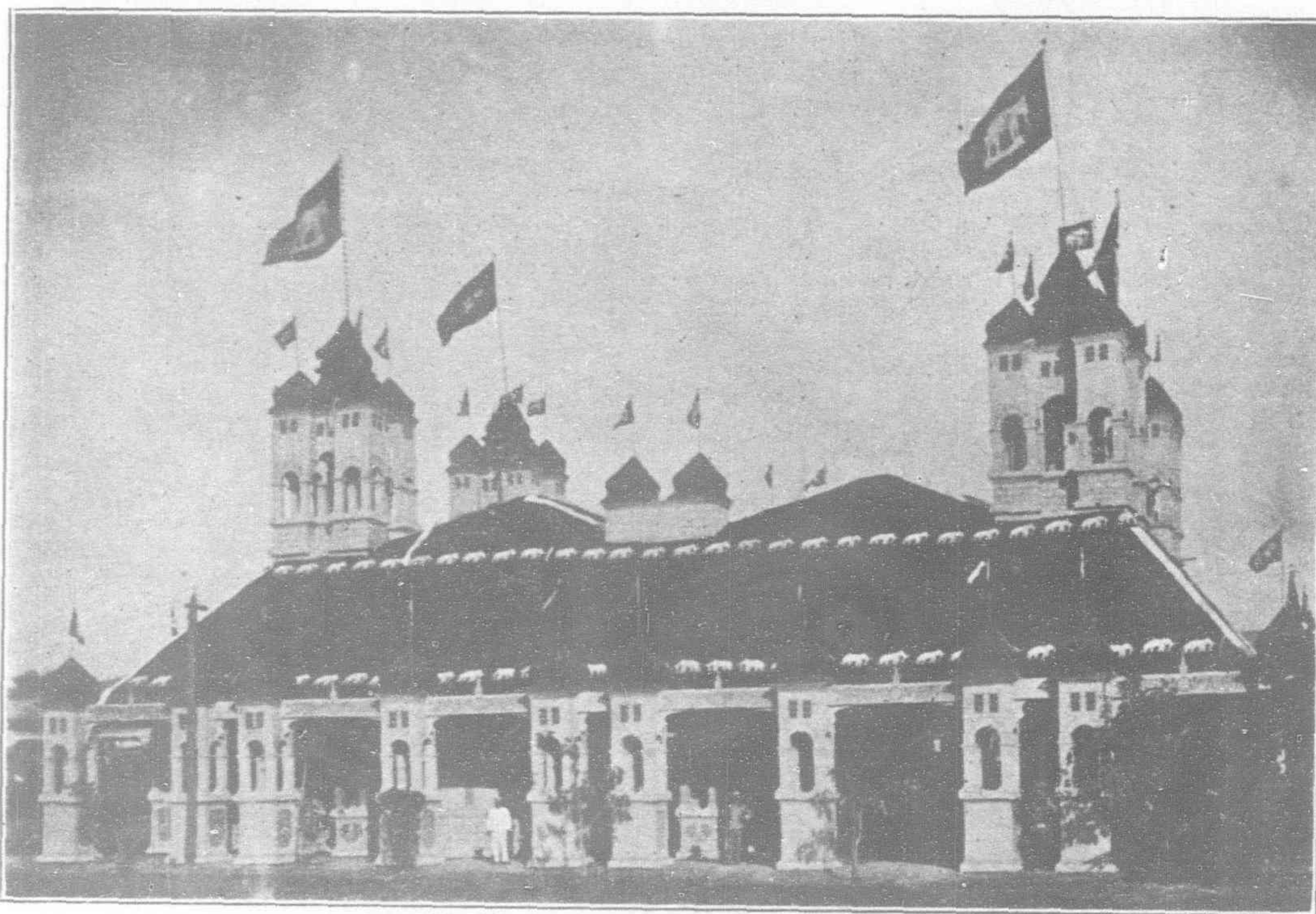
"By Your Majesty's most gracious commands the Ministry of Public Works has now

"**EARTHWORKS.**—Owing to the soft nature of the ground the execution of earthworks has caused some little difficulty, especially so at the ramps of the bridge approaches. The surface at these places being unable to support banks built of earth in the ordinary way, paddy ash was used for the purpose, and this being of a very light nature the difficulty was satisfactorily overcome.

"The earthworks amount to a total of cbm. 752,000 at a cost of Tics. 500,000, or Tics. 0.67 per cbm.

"**ROLLING STOCK.**—For both Petrieu and Pitsanuloke lines rolling stock was put up to public tender and the orders placed in the following countries:

16 Locomotives, 1 inspection coach, and 85 goods wagons from Germany	cost	£59,714
73 Passenger and luggage vans from England	cost	37,375
180 Rice and ballast wagons from Belgium,	cost	25,030



J. Antonio, Photographer.

ROYAL PAVILION AT THE BANGKOK TERMINUS, SIAM ROYAL STATE RAILWAY

completed two further sections in the general scheme of railway extension sanctioned by Your Majesty.

"These sections comprise the first portion of the Eastern trunk line, that from Bangkok to Petrieu, and the third section on the main line from Bangkok to the North, that is Paknam Pho to Pitsanuloke.

"These extensions must be very pleasing to Your Majesty, for they bring Your Majesty into closer touch with the people and thereby foster a spirit of loyalty to Your Throne and person, and at the same time enable the functions of Government, in all its administrative branches, to be better performed.

"With Your Majesty's gracious permission I will now give a few particulars concerning the construction of these lines.

"**EASTERN LINES BANGKOK-PETRIEU.**—The work on this line was commenced in November 1905, the total length is 634 kilometres, and the gauge the same as that on the Korat and Northern lines. It is practically level throughout and passes over a rich paddy plain lying between the Me Nam and the Bang Pa-Kong rivers. The district is well populated and most of the land is cultivated.

"**EXPROPRIATION OF LAND.**—This has proceeded satisfactorily, the total cost amounting to about Tics. 45,000 or Tics. 29 per rai.

"**BRIDGES.**—Three types of bridges have been used, viz:

1. Timber structures on wood piles.
2. Steel girders on masonry abutments.
3. Steel girders on screw piles.

"On the first named only two have been built, it being found that the cost of piling, owing to the long lengths required, made them as expensive as steel girder bridges.

"Of type No. 2, 10 bridges have been built, each bridge being of ten metres span; these are of solid construction and have given satisfactory results. Of the third type, several of the bridges have not been a success. Through the swampy nature of the ground many of the screw piles sunk below the theoretically calculated depth considered necessary to substitute concrete piers and abutments. This work is now being carried out and will be proceeded with without interrupting the traffic.

"**PERMANENT WAY.**—This is of the same description as the Northern lines; the sleepers have been obtained from the Khorat district, and the ballast from the Pak Preo and Chong Keh quarries.

"**STATION BUILDINGS.**—A brick station building with tile roof has been erected at Petrieu, also a locomotive shed and turntable, as well as quarters for the officials and men of the traffic and maintenance service.

"**COST OF LINE.**—The original estimated cost of the line was Tics. 3,200,000. The actual cost cannot yet be stated as the work is still uncompleted. It is not, however, likely to exceed the estimate by any large amount, and the cost per km. will probably be about Ticals 51,000.

"Petrieu being well connected with Bangkok by means of Klongs, and also by sea, it is not expected that the line will derive much benefit from paddy transport. This however will be compensated for by the passenger and light goods traffic, the prospects of Petrieu which formerly took 2 days will now be done in two hours. Not the least important matter is the fact that this is the first section of the Eastern trunk line to the provinces of the Pachim and Chantabun.

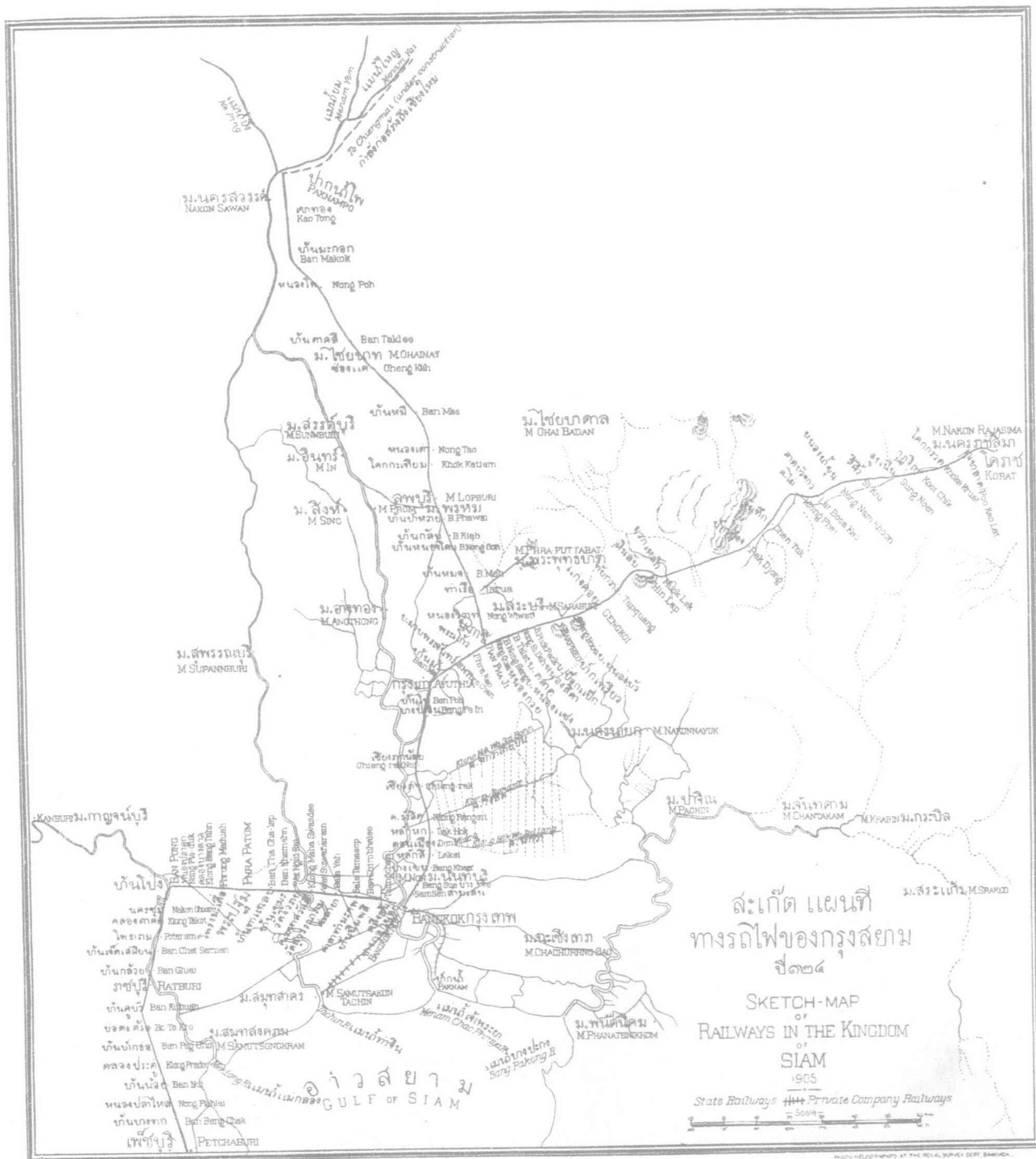
"**PAKNAM PHO TO PITSANULOK.**—This line, 138 Kms in length, was commenced in January 1903. It runs in a Northerly direction from Paknam Pho and completes another section of the main line from Bangkok to Chiangmai; of this Northern line a total distance of 338 kms has been constructed, leaving 334 kms to complete the work. The line follows in close proximity to the Me Nam Yai and traverses a large plain covered with high grass and jungle, which is subject to yearly inundations to a depth of two metres.

"EARTHWORKS.—These have not been carried on without difficulty, and the expense has been high. The floods necessitated an embankment 2 to 3 metres high, with many places of 6 metres in a lower ground. During the rainy season extensive slips occurred in these banks, and these had to be made good

"BRIDGES.—Of the 93 bridges constructed 4 only are of steel, the remainder being of timber of the ordinary type in general use.

"PERMANENT WAY.—It is of the usual type, gauge 1.435m., weight of rails 25 kgm. per

ings, which are in course of construction. For the smaller stations the usual type has been adopted. A turn table and engine shed has been provided for at Pitsanuloke, and the necessary quarters for the officials where required.



Courtesy Director-General Royal State Railways.

RAILWAY MAP OF SIAM

with earth of a harder nature brought by train from the high ground South of Paknampho. The works were also completely stopped during each wet season for several months. All these added considerably to the cost which amounted to T.4,100,000 for the 5,177,461 cbm. executed or T.30,000 per km. as an average amount of T.11,000 for the other lines in the country.

metre, laid on wooden sleepers which have been cut locally in the forests South of Paknam Poh. The ballast has been obtained from the quarries South of Paknam Poh, also from an isolated hill of granite near Pichit.

"STATION BUILDINGS.—At Pitsanuloke and Pichit it is intended to erect brick build-

"TOTAL COST.—There being still considerable work to be done in completing the earthwork, ballasting, etc., the exact cost cannot yet be given, but according to the Director's estimate it will amount to about T.10,500,000 or T.76,000 per km. This is an excess of T.12,500 over the average cost of the existing lines, and due entirely to the heavy earthworks.

"It is not probable that this line will add much to the traffic receipts for some time to come, for the country traveled is poor and the population scanty. The importance of this section is mainly due to its being an important link with the line under construction to Utaradi, the well known trading centre in the No, and to its being another completed section of the main line to Chiangmai and the North."

Through the courtesy of the Hon. L. Weiler, Director General of the Royal State Railways, the FAR EASTERN REVIEW is in

After deducting 10% of the net earnings for the renovation fund there remains a profit on an average of 5.75% on original cost of all the lines operating including additional accommodation on the lines up to March 31st 1907. The renovation fund on this date had a balance of Ticals 307,833.37.

The average cost of construction, including the acquisition of the land, all the works, equipment, shops, rolling stock, telegraphs, etc., and even including the sum of over 17,000 Ticals for a fiesta in connection with the

a large passenger traffic. At first, trains of four coaches were found quite sufficient to meet the demand, then the passengers increased to such an extent that first two extra coaches were kept regularly running, and now the ordinary train consists of twelve carriages, while on certain occasions the trains have numbered sixteen coaches. The carriage of goods also shows a gratifying increase.

"People journeying from distant parts to Petriu and thence to Bangkok by rail are often unable to make the outward and homeward journey in one day, and to make provision for those who are compelled to stay at Petriu overnight, the Royal Railway Department is, we understand, going to erect a number of houses and shops. The management of these will not be undertaken by the department, but the houses will be rented. Thus it will always be possible for travellers to obtain food and accommodation.

"The question of lighting the trains by electric light has also been receiving attention of late, and installations of dynamos, accumulators, etc., have been fitted on to some inspection cars, with, we believe, satisfactory results. It is hoped when the next section of the northern line to Utaradi is opened that the trains running there will be lighted by electricity."

The accompanying map is published by the courtesy of Director General Weiler.

In March, 1892, the King cut the first turf of the first State Railway in Siam. The first section brought into use was that from Bangkok to Ayuthia, opened by His Majesty in March, 1897, on the eve of his first departure to Europe. Before the end of the year the trains were running to Gengko. In November 1900 the line was opened through to Korat, and in April 1901 the section of the Northern Line to Lopburi was opened to traffic. Then in 1903 came the opening of the Petchaburi Line, and in November 1905 the traffic on the Northern Line was extended to Paknampoh.

JAPANESE-BUILT LOCOMOTIVES

The railway authorities of Japan believe that they can save about yen 2,000 each by having their locomotives built in Japan. For the purpose of experiment the works at Hyogo recently turned out one engine which is now being used on the Tokaido Railway. Four



J. Antonio, Photographer.

GUARD OF HONOR AWAITING ARRIVAL OF HIS MAJESTY THE KING OF SIAM AT BANGKOK TERMINAL, ROYAL STATE RAILWAYS

receipt of the annual report for the year ending March 31st, 1907. This report deals with the administration and traffic of the system in operation for the period referred to. During the year there were 423.79 kilometers of standard gauge, known as the Korat and North Line and 151.05 kilometers of one meter gauge known as the Petchaburi line, in operation and during the next fiscal year (concluded March 31, 1908) the following openings were anticipated, of which the reference above is a part:

64 kilometers on the Eastern line between Bangkok and Petriu and 138 kilometers between Paknampoh and Pitsanuloke.

The receipts for the year to which the report refers on all the lines amounted to

Paknampoh line, for each kilometer was Ticals 57.551.

The rolling stock consists of 48 locomotives of German and English make, ten of which were working on construction and 8 were operating on the meter gauge. The manufacturers who supplied these locomotives are:

Hunslet & Sons in Leeds; Dubs & Co. in Glasgow; Pecket & Sons in Bristol; Kraus & Co. in Munchen; Hannover'sche Maschinen-Fabrik vorm. Eggestorff, Linden vor Hannover.

The number of tickets sold for the year were 2,640,782 and the receipts from passenger traffic, Ticals 2,267,100; the receipts from freight traffic amounted to Ticals 1,439,493.

The amount expended in construction of new lines during the year was Ticals 226,368.



J. Antonio, Photographer.

TRAIN ARRIVAL AT PETRIEU STATION, ROYAL STATE RAILWAYS

Ticals 3,511,345 and the expenditures Ticals 1,276,809, leaving the net earnings, Ticals 2,234,538. The percentage of increase compared with the previous year on receipts was 24.27%; on expenditure, 24.34% and on the earnings, 21.71%.

The last word on the success of the new extensions of the Siam railways comes from the *Bangkok Times* of recent date. That paper says:

"The new railway to Petriu, opened by His Majesty on January 24th 1908, is attracting

more locomotives have been ordered at these works for further experiment and if satisfactory the manufacture of locomotives will be carried on in a large scale by the Imperial authorities. The product of the Wakamatsu foundry is being used in these experiments.

* THE METALS IN 1907

COPPER.

For the first time in fifteen years, the world's production of copper in 1907 showed a decline. Amounting, as it did, to 713,000 tons, it was 5,000 tons, or .7 per cent. short of that of the preceding year. As to the general conditions of the production and consumption of the metals in the different

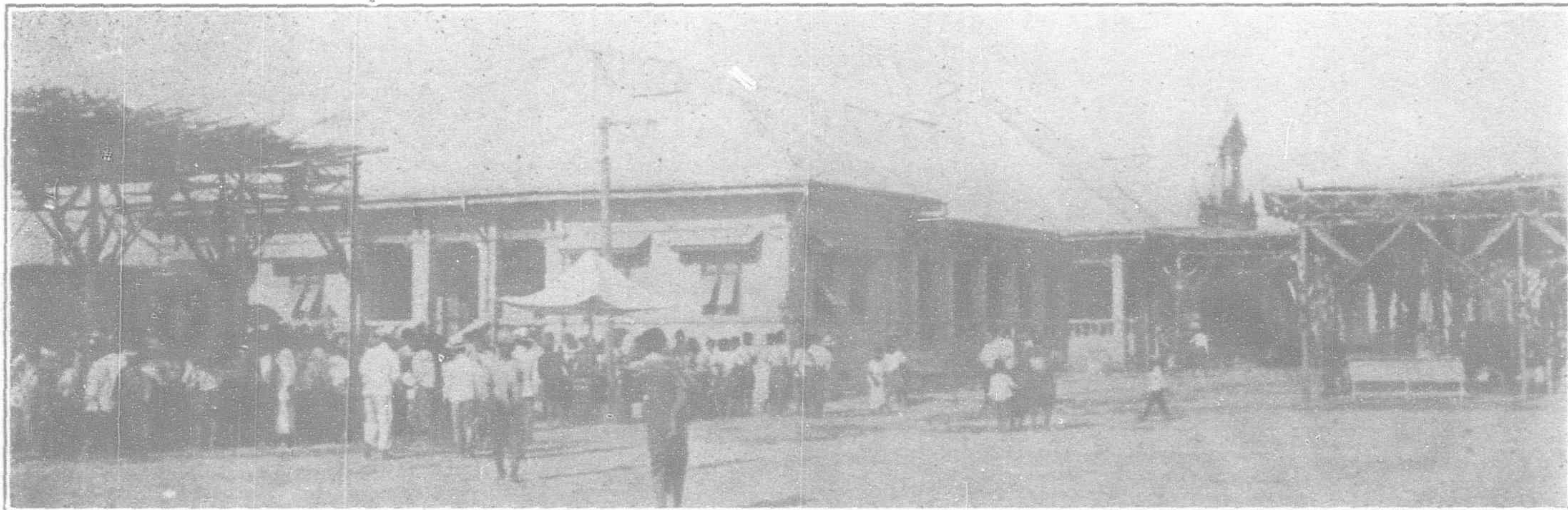
duction, at the end of the year large stocks had accumulated in America.

The first among the American copper producers to publish its annual report for 1907 has been the Oscoda Consolidated Mining Company. One of the facts mentioned in that report, which ought to be particularly pointed out, is that the total cost of production per lb. of copper, which in 1906

the year, when the increase in the visible stocks stored in Europe and the estimate of 45,000 tons for the stocks in the United States are taken as a basis, the following figures are arrived at:—

1904.	1905.	1906.	1907.
655,000	723,000	723,000...	675,000

The decline, compared with 1906, therefore amounts to 48,000 tons, or 6.6 per cent. Like the decline in production, that in consumption is to be debited exclusively to the United States of America. The consumption there may be estimated at 232,600 tons, as against



J. Antonio, Photographer.

NEW GOVERNMENT HEAD OFFICE (FRONT VIEW) PETRIEU, ROYAL STATE RAILWAYS

countries, the comparative tables appended to this and the following extracts give comprehensive and detailed information.

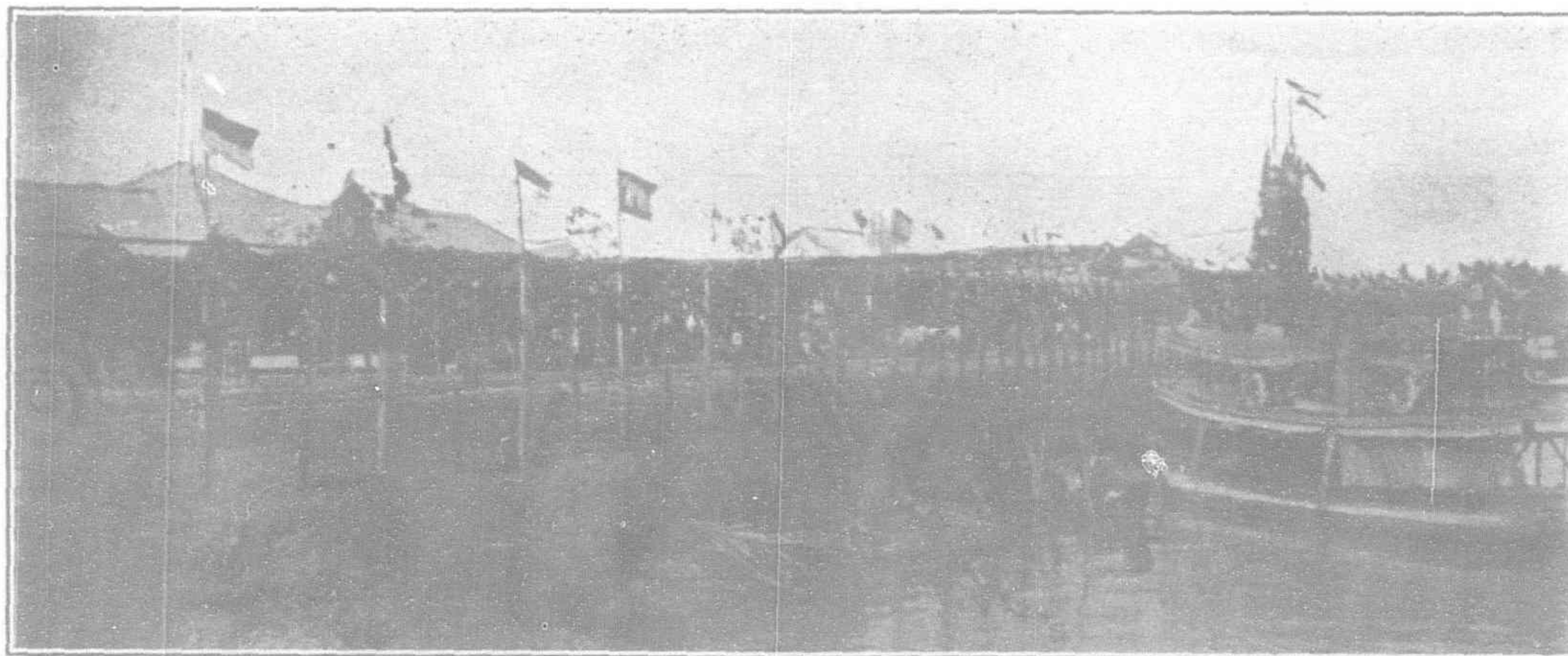
In the United States of America, owing to economic and technical reasons which are well known to our readers, the output of copper receded by 10,200 tons. The consumption, however, which during the first five months of the year had been so brisk that at times an actual copper famine prevailed,

amounted to 10.89 c., rose in 1907 by 1.55 cent, or 14 per cent., to 12.44 c. Compared with 1904, the increase in the cost of production amounts to 2½ c. per lb., or 25 per cent.

The stocks of copper which had accumulated in the United States at the end of the third quarter of 1907 must have experienced a large reduction during the last quarter, as is shown by a comparison of the export

258,600 tons during 1906, a decrease of 66,000 tons, or 22.1 per cent. This decrease has no parallel, either in actual figures or in percentages, in any one of the preceding years.

Germany's copper statistics for 1907 show only unimportant changes when compared with those of the preceding year. The production of 31,900 tons remains about 400 tons behind that of the preceding year, while the consumption has receded by 1,300 tons to



J. Antonio, Photographer.

DECORATIONS AND ILLUMINATIONS IN FRONT OF THE HEAD OFFICE AT PETRIEU IN HONOR OF KING'S VISIT

weakened at the end of the first half-year, and during the second half sometimes came almost to a standstill, the consequence being that, notwithstanding the decline in the pro-

figures of the United States for the single months. While the monthly average of the shipments during the first nine months amounted to about 14,000 tons, the figures of the exports during the last three months are as follows:—

October	about 28,000 tons.
November	" 38,500 "
December	" 37,300 "

In computing the world's consumption for

149,800 tons. The excess of exports of copper in finished goods and alloys over imports stands, with 31,500 tons, at the level of the preceding year.

As to Russia, the conditions of production, as well as of consumption, have undergone a very material change when compared with the preceding year. According to the figures communicated to us by competent Russian firms in the copper trade, the pro-

[*Specially Translated and Compiled for "The Mining Journal" from the Report of der Metallgesellschaft und der Metallurgischen Gesellschaft A.-G., Frankfurt a./M., March 1908.]

duction has risen from 10,700 tons to 15,000 tons—i.e., by more than 40 per cent. Imports, on the other hand, receded to one-third of their previous figure—viz., from 13,200 tons to 4,500 tons—while, at the same time, Russia began to appear among the copper exporters, though not to a very considerable extent. Her copper exports in 1907 amounted to 1,500 tons, as against 400 tons in 1906 and nil in 1905. Simultaneously with these changes the consumption of copper in Russia has declined by 5,500 tons, or 23.4 per cent. According to the opinion prevailing in expert circles, the development of Russia's

America—				
U. S. A.	380,900	412,600	430,500	421,400
British North America	8,000	10,700	13,800	14,000
Central and S. America	74,500	80,900	63,000	57,000
Total (America)	463,400	504,200	507,300	492,400
Asia—				
Japan	21,100	33,700	*43,400	*45,000
Australia	22,700	23,900	29,500	32,500
World's total	647,900	693,900	717,800	712,800
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Average London price	59 0 6	69 12 0	87 8 6	87 1 8

TIN.

The world's production for 1907 remained, with 98,700 tonnes, almost unchanged from

have receded by about 8,400 tonnes, while at the same time, stocks, which during the preceding year increased by 1,260 tonnes, have in 1907 decreased by 2,850 tonnes. The exports amounted to 570 tonnes, as against 820 tonnes in 1906. The decline in the consumption has almost exclusively to be debited to the last months of the year. While imports during the first ten months averaged about 3,200 tonnes monthly, they receded during December to 1,200 tonnes.

Production of Tin in Metric Tonnes.

	1904.	1905.	1906.	1907.
Straits shipments..	61,838	59,500	59,875	56,550



J. Antonio, Photographer

PETRIEU RAILWAY STATION, SIAM ROYAL STATE RAILWAYS

copper production is likely to make further progress during the next few years. If this opinion should be verified by events without producing increased activity in Russia's copper consumption, a turning point in the history of Russia's copper industry would be arrived at, in so far that the country would develop from a copper importer to a copper exporter. During the near future, however, Russia will not be in a position to bring her copper imports to a full stop. Those imports consist almost exclusively of electrolytic copper, which the electrolytic works at present existing in the country are unable to produce in the required measure. But in view of the fact that copper shipped to Russia has to pay a considerable import duty—about £32 per ton—the transition from the condition of a copper-importing to that of a copper exporting country must, as a matter of course, be assisted by appropriate economic measures. With this end in view, the Russian copper producers have formed an association for the purpose of erecting, in common, an electrolytic copper refinery in Russia.

Neither as to shipments to China, nor as to the copper consumption of that country during 1907, is it possible as yet to give definite statistics. The United States exported in 1907, 4,500 tons to China, as against 2,200 tons for the preceding year, while Chinese imports from Japan amounted in 1907 to 12,100 tons, against 5,800 tons in 1906. How far this increase in Chinese imports has actually entered into the consumption there cannot as yet be correctly ascertained, figures relating to re-exports of copper from China for 1907 not being available as yet. In 1906 those re-exports amounted to 7,200 tons, so that during that year only about 800 tons became part of the Chinese consumption. It is, however, a fact already ascertained, that during 1907 the re-exports from China were rather unimportant. Another circumstance which deserves to be pointed out is that China of late has appeared in a much larger measure as a buyer of copper.

Production of Copper in Metric Tonnes.

	1904.	1905.	1906.	1907.
Europe—	30,300	31,700	32,300	31,900
Germany	65,000	67,900	72,700	72,400
England	6,900	7,600	5,800	*7,500
France	3,600	3,600	4,300	*1,000
Italy	1,500	1,400	1,500	1,100
Austria-Hungary	10,900	8,900	10,700	*15,000
Russia	11,500	11,000	10,300	*11,000
Sweden, Norway, Spain, Balkan States	129,700	132,100	137,600	142,900
Total (Europe)				

the preceding year, while the total value of the output, owing to the lower average price of the year receded by about 5 per cent. The fluctuations in the amount of public stocks have been quite unimportant during the last three years. While the visible supplies in Europe and America at the end of 1907 show the small reduction of 200 tonnes, the aggregate stocks have been subject to an increase of 100 tonnes, owing to a strengthening of the Banka reserves. The currency conditions in the Straits Settlements have in the meanwhile been rendered more stable, and the Straits dollar is now independent of the fluctuations in the price of silver. It has also acquired a higher value when compared with former years, and this fact, in conjunction with the circumstance that the alluvial deposits now in course of exploitation are becoming poorer and gradually approaching exhaustion, has caused an increase in the cost of production, which has only partly been compensated for by the introduction of modern methods of recovery. The transition from open workings to deep level workings will probably every year make strong advances in the Straits Settlements.

Germany's tin production will presumably be shown to have suffered a slight decline, and, in view of the fact that the excess of exports over imports has also decreased, it may be assumed that the consumption during 1907 has only been about 15,100 tonnes, or 700 tonnes less than in the preceding year.

England has increased her production, from her own and foreign ores, to 14,800 tonnes, which is about 900 tonnes more than that of the preceding year. The imports rose by 200 tonnes to 44,500 tonnes, while, on the other hand the exports receded by about 5,400 tonnes to 36,000 tonnes. Public stocks in England have at the same time increased by about 2,800 tonnes, the result being that the apparent consumption has risen by 2,500 tonnes to 20,500 tonnes.

None of the other European countries shows an increased consumption; on the contrary, in most of them a decline has taken place, which, as the percentages for the single countries are not unimportant, is not likely to amount in the aggregate to more than about 1,800 tonnes.

The United States of America have suffered the heaviest decline in the consumption of tin—viz., 4,000 tonnes, which brings its total consumption down to 39,700 tonnes. Imports

England—				
(a) Production from domestic ores	4,198	4,538	4,594	*4,800
(b) Production from foreign ores	7,450	8,500	9,350	10,020
Banka sales in Holland	11,735	10,260	9,450	11,440
Germany	5,000	5,233	6,600	*6,500
Australia	5,300	5,800	7,400	7,100
BHilton sales in Holland and Java	3,251	2,760	1,980	2,260
Total	48,800	56,600	58,800	58,700
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Average price for the year	126 14 8	143 1 8	186 12 11	172 12 9

LEAD

The world's production of lead, which in 1906 showed a decrease of 13,000 tons on that of 1905, will probably be found in 1907 to have more than recovered its previous loss. According to the statistical material we have so far been able to collect, the world's production for 1907 amounts to 992,000 tons, and, therefore, exceeds that of the previous year by 21,000 tons, equal to 2.2 per cent.

The United States of America during 1907 recovered from its own ores 325,700 tons of lead, which represents an increase of 9,900 tons when compared with the previous year. The imports of pig lead having slightly declined, while at the same time the exports somewhat increased, we find as a prima facie result that the consumption should have amounted to 351,400 tons as against 349,200 tons in 1906. This figure, however, does not truly represent the consumption of the United States, considerable quantities of pig lead, estimated by the "Mining & Engineering Journal" at 45,000 tons, having accumulated at the end of the year in the hands of producers, as against only 3,600 tons at the end of 1906. According to these figures the real consumption of the United States during 1907 would amount to 310,000 tons, which is less than the consumption of 1905, while it represents a loss of fully 11 per cent. when compared with 1906. Owing to the decreased consumption during the last months of 1907, the American lead producers, headed by the American Smelting & Refining Company, were induced to restrict their production in order to prevent an excessive accumulation of stocks.

These restrictions are being continued even now. According to the information received here at the end of February, the American Smelting & Refining Company has reduced its operations to fifteen furnaces (though its full capacity consists of twenty-seven furnaces),

while the United States Smelting Company has only three of its six furnaces working. The reason of this is to be looked for in the lower prices of ores which have caused a marked reduction in the supplies of lead ore. To mention only one instance, there is the Coeur d'Alène district, one of the chief producers of lead ore, where the ore production amounted to no more than 50 per cent. of its normal figure.

The production of Mexico receded in 1906 from 75,000 tons to 54,000 tons—a loss of 21,000 tons, or about 24 per cent.; but in 1907 it rose again by 18,000 to 72,000 tons. How far the currency law of May 1, 1906—in virtue of which Mexico adopted the gold currency and gave the silver dollar a fixed value—has influenced the lead production, which is generally very intimately connected with the silver production, cannot yet be finally determined on the basis of the production of last year. An accurate judgment in this respect will only be possible after we have passed through a prolonged period of lower silver prices than the last three years have witnessed. It is probable that a longer period of low silver prices will unfavourably influence the lead and the silver production of Mexico, for owing to the fact that wages, salaries, and other expenses have to be liquidated in gold currency, the cost of production will not be affected by the fluctuations in the value of silver, while the prices realised for silver in bullion and ores will recede in accordance and in the same proportion with the receding money value of silver.

PRODUCTION OF LEAD IN METRIC TONNES

	1904.	1905	1906.	1907.
Spain.....	177,800	180,700	180,900	185,800
Germany.....	137,600	152,600	150,700	*140,000
France.....	18,800	24,100	25,600	*23,000
Great Britain.....	24,400	23,300	21,400	*20,000
Belgium.....	23,500	22,900	22,200	25,800
Italy.....	23,500	19,100	21,300	22,900
Austria-Hungary.....	13,100	13,500	16,400	15,400
Greece.....	15,200	13,700	12,100	13,800
Sweden.....	600	600	800	*700
Russia.....	300	300	*300	*100
Turkey (Asiatic).....	10,700	10,400	9,600	10,400
U. S. A.....	296,000	312,500	334,800	340,700
Mexico.....	83,900	*75,000	*54,000	*72,000
Canada.....	17,200	25,700	23,800	*21,000
Japan.....	1,800	2,300	3,500	*3,500
Australia.....	119,400	107,000	93,000	97,000
Other countries.....	800	200	200	*200
Total.....	964,100	981,900	970,600	992,300

Average price of English lead in London. £11 19 8 £13 14 5 £17 7 0 £19 1 10

ZINC

The world's production of zinc in 1907 shows a further increase, which amounts to 36,400 tons, or about 5 per cent. The largest share in this increase falls to the part of the United States of America.

Germany's zinc production shows, with 208,700 tons, an increase of about 3,000 tons, or 1½ per cent. To this total Silesia contributed 138,400 tonnes, and Rhineland and Westphalia 70,300 tonnes. For the first time Germany had to be content with second place among the world's zinc producers, her output having been exceeded by America. Germany's zinc consumption of 174,900 tonnes was less by 4,400 tonnes, or about 2½ per cent. than in the preceding year. Her imports of spelter, amounting to 28,500 tonnes, receded by 8,500 tonnes, against those of the previous year, which amounted to 37,000 tonnes, but they still exceed the imports for 1905 by about 1,700 tonnes. German exports of zinc were not subject to any material fluctuations during the last three years; for 1907 the slight decrease of 1,200 tonnes to 62,200 tonnes has taken place. Germany's production of zinc ores during 1907 has not yet been definitely ascertained. Imports increased by about 5,700 tonnes to 184,700 tonnes, while at the same time the exports receded from 42,600 tonnes to 34,900 tonnes. The excess of zinc exports in finished goods amounted in 1907 to 35,800 tonnes as against 30,500 tonnes for the preceding year. The increase is, therefore, 5,300 tonnes, or about 16.5 per cent.

* Provisional figures.

The United States of America, with an output of 226,860 tonnes, have advanced to the foremost position among all zinc producers. The increase over the preceding year amounted to 24,700 tonnes, or about 12 per cent., the greatest portion of which has been contributed by Illinois, the Eastern and Southern States, and Kansas. The consumption in the United States, however, has probably not exceeded that of the previous year, when 200,000 tonnes were worked up locally. We arrive at this conclusion by taking account of the existence of stocks, which, according to a communication by the "Mining & Engineering Journal," are likely to have amounted at the end of the year to 22,000 to 30,000 tonnes. In view of the heavy decline of the consumption in the United States during the closing months of 1907, combined with the disproportion which prevailed at one time between the prices of zinc ores and spelter, several zinc-producing concerns have decided upon partly or entirely closing down their works, and, as a consequence of this measure, zinc ore producers, too, have felt induced during the last months of 1907 materially to restrict their output.

An event of far-reaching importance is the formation of the Association of German Zinc Smelters. In the first instance, the association was planned for a period of three years, the expectation of the founders being that they would succeed in inducing the Belgian zinc works—which are naturally in a position to exercise a strong influence upon the German as well as upon the English market—to arrive at a common agreement concerning the determination and regulation of the production of the several works. If such an agreement should be concluded, the output of the existing zinc works, and those which are now in course of erection, would be regulated for the next three years.

Production of Zinc in Metric Tonnes.

	1904.	1905.	1906.	1907.
Rhenish Westphalia	65,388	67,243	68,697	70,268
Silesia	125,672	129,941	136,326	138,439
Belgium	139,982	145,392	152,461	154,492
Holland	13,099	13,767	14,650	14,990
Great Britain ..	46,216	50,927	52,587	55,595
France and Spain ..	49,082	50,369	53,786	55,733
Austria and Italy ..	9,248	9,357	10,780	11,359
Russia	10,606	7,642	9,610	9,738
Europe	459,293	471,800	498,897	510,614
U. S. A.	165,850	183,245	202,092	226,838
Australia	290	650	1,026	996
Total	625,400	658,700	702,000	738,400
Average price for the year	£22 11 10	£25 7 7	£27 1 5	£28 16 9

STEEL COAL CARS FOR PEKING-KALGAN R. R.

The fifty 20-ton-all-steel coal cars recently delivered by the Leeds Forge Company to the Imperial Railways of North China for the Peking-Kalgan line are described as follows:

	Feet.	Inches
Length over buffers.....	24	3
„ „ headstocks.....	21	6
„ inside.....	21	3
Width inside.....	7	8½
Height from rail level to top of side.....	8	8
Heights from floor level to top of side.....	4	9¾
Cubic capacity.....	810	
Wheel diameter.....	2	9
Wheel base.....	12	
Journals.....	10+5	

On each side of these cars there are two door openings, constructed of the Leeds Forge Company's patent corrugated pressed steel, each door opening being 4 feet 2 inches in width and 2 feet 3½ inches in height. The wagon sides are constructed of 7lb. steel plates. The cars are fitted with a side lever brake operating one block to each pair of wheels, whilst central buffers and Janneys' couplers are also provided.

THE WAKAMATSU FOUNDRY

Mr. Nakamura, Superintendent of the Wakamatsu Foundry, in replying to questions addressed to him during the session of the Agri-

cultural and Commercial section of the Budget Committee did not confirm the optimistic statements which were recently circulated about the state of that enterprise. He said that in no country had such a work been brought into a really successful condition within a shorter period than ten years. The smelting furnaces at Wakamatsu have been in operation since 1901 and were fairly successful, but most of the other departments were opened only recently, and it will take two or three years longer to get them into a thoroughly satisfactory condition. One great difficulty under which this Foundry is is the cost of coal, which is so expensive as to interfere seriously with the competitive ability of the works. At present about 130,000 tons of iron are turned out annually, but this amount is far from meeting the demand in Japan, and on the other hand the Foundry in existing circumstances can not produce iron as cheaply as it may be bought from foreign countries. The only hope, so far as he could see, lay in tariff revision, which would be possible in 1911.

Mr. Kanematsu inquired whether in such circumstances it would not be better to rely on imported iron for ship-building purposes; also whether there was no prospect of getting cheap fuel, and finally whether no hope is entertained of being able to supply the need of the Japanese market in the course of the next ten or fifteen years without relying on State aid or tariff revision. Mr. Nakamura replied that the price of coal had risen enormously during the past few years and that unless the Foundry could get its fuel at about 4 yen a ton or less, its chances of turning out cheap iron were small. There was a good hope of obtaining satisfactory ore in Japan but at present the Foundry relied entirely upon the supply coming from the Taiya mine in Chin. As to the import duty which it would be necessary to impose on the occasion of tariff revision, he could not speak with absolute accuracy, but he presumed that something like the rates charged in Germany and the United States would be levied. The delegate refused to pronounce any opinion in his official capacity as to the advantage or disadvantage of converting the Foundry into an enterprise carried on jointly by the Government and a private company, or converting it altogether into a private concern. As an individual, however, he did not hesitate to say that its prospects as a purely State enterprise were not bright.—*China Mail.*

KANABOI MINING COMPANY'S PLANT

A description of this company's extensive plant in the Kanaboi valley is given in a recent number of the *Malay Mail* as the result of an excursion to the mine under the direction of Mr. Richardson, the managing director.

The Kanaboi valley, which extends from Bukit Hitam to the Pahang watershed, has long been under the eye of the prospector and it is the development of the deposits of tin ore, which contains a percentage of alluvial gold, that this company has in view.

The works are connected with the Konkoi River a distance of two miles by a light railway operated by the company. The company has built a masonry dam across the Konkoi river above the Falls and from there a strong force of water is led through iron pipes down to its Kanaboi Concession which consists mainly of a large extent of flat land being worked by hydraulic monitors, the tailings difficulty being overcome by the use of elevators, the main idea being quick and efficient working at a moderate cost. The mining of tin is the chief object in view, but fair quantities of alluvial gold are found with the tin ore and are separated by a special process.

The elevator sucked up the stones and gravel from the bottom of the mine into the tail race. The company, so far, has done little more than development work and has been hindered a good deal by heavy rains and floods, but, with the change of season now, they should be able to go ahead in good earnest. The Kanaboi river will also be worked by a dredger, which has been built and will be started soon.

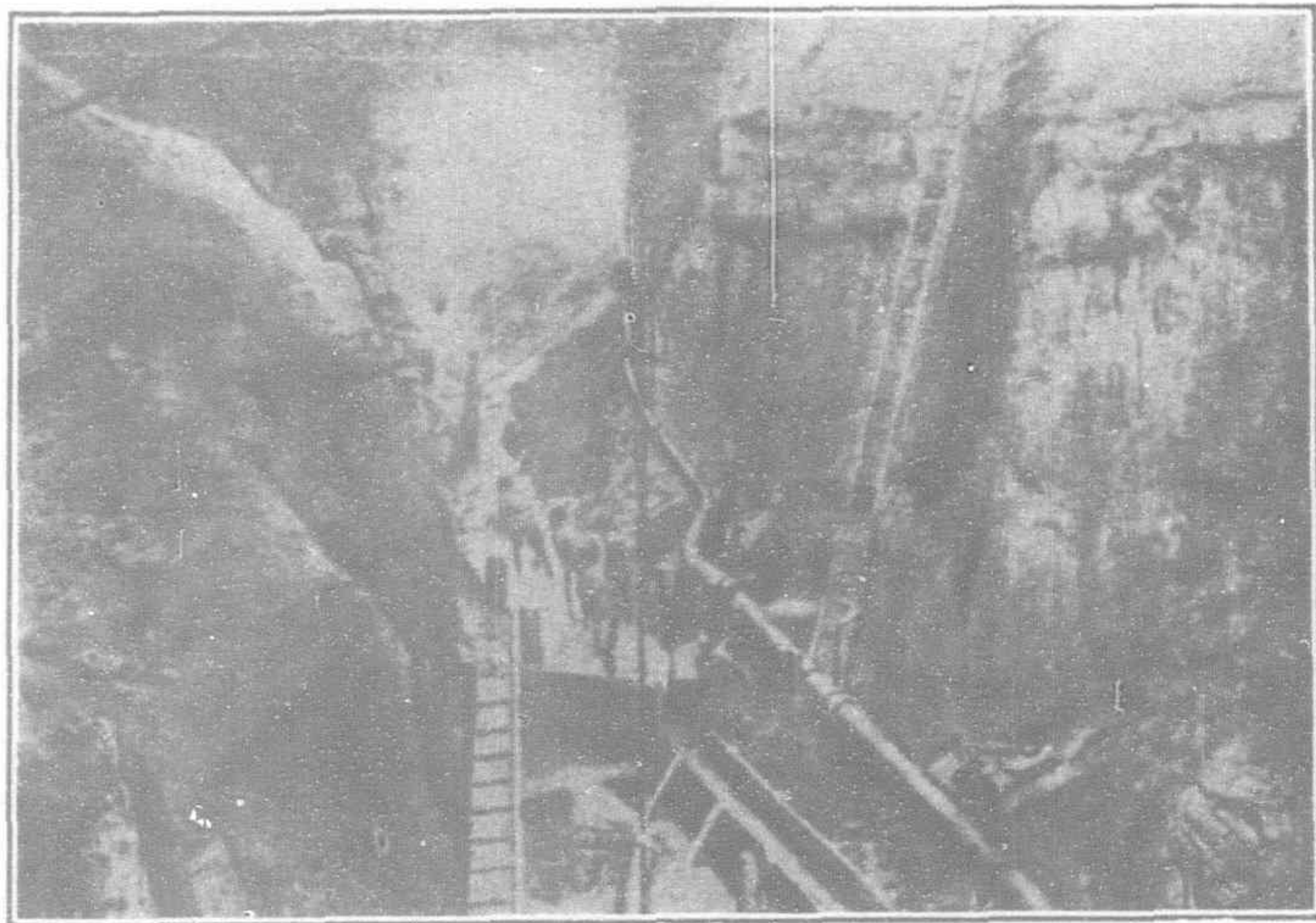
HYDRAULIC GOLD MINING IN BURMA

An interesting review of the workings of the Shweli Syndicate, Limited, one of the largest hydraulic gold mining plants in Upper Burma, is published with an illustration in *Capital*. It is reproduced by the FAR EASTERN REVIEW in view of the importance of this institution as a pioneer in that section of the East. *Capital* says:

"A few years ago there was discovered a large gold bearing gravel deposit in Upper Burma with all the necessary conditions to apply this method of mining there and the Shweli Syndicate, Ltd., was registered in

methods for recovery of the gold a return of over one shilling per cubic yard will be attained, which is more than double of any American Hydraulic Mine.

"Hydraulic mining has been in existence in California, U. S. A., for the past 50 years, and under modern methods has been reduced to so fine a science that even wherever the gold bearing gravels run only some 3d. worth of gold in a cubic yard, it can be placed upon a safe basis for a regular dividend-paying concern, and is known over there as the safest form of mining, as the



THE SHWELI HYDRAULIC GOLD MINING CO.'S WORKS IN BURMA

Rangoon to prove the property. Their Managing Director visited California with a view to comparing the proposition with the mines at work, and to obtain the latest and the most up-to-date methods and information in that form of mining. A large pumping plant, pipe line, boring machine and tackle were purchased to the extent of £5,000 to prove the mine, and towards the end of last year were erected on the property. In December last hydraulic mining commenced, and has been at work ever since, the results proving far better than was anticipated. The first hundred hours test put through 100 cubic yards, or about 160 tons of dirt and gold actually recovered to the extent of 9d. to the cubic yard, although in hand washing down the concentrates an unavoidable percentage was lost, which can easily be overcome with improved methods of recovery. Platinum is also present in the black sand, and the market value of the gold is £4-4-0 an oz. The gold bearing gravel has been traced and surveyed for over 3 miles by 2 miles wide and from 90 ft. to 294 ft. in depth, and taking it at an average of the former figure there are over 500,000,000 cubic yards to be washed, or in other words the mine cannot be worked out for a hundred years.

"The photographic view of the mine shows the hill being hydraulically attacked.

"It is now intended to carry through the bigger scheme on the same lines as the La Grange Hydraulic Mines in America, and to wash from 5 to 6 million cubic yards per annum. For this purpose the water rights of a large stream in the neighbouring mountains have been acquired from Government, for the purpose of bringing down the water under pressure and washing away the whole of the hill with giant nozzles. The gravels are also picked up lower down and form ideal paddock dredging grounds. It is intended to drive the dredgers by electricity, the energy from 2,000 to 4,000 horse power being derived from the above mentioned water fall.

"It is estimated under the bigger scheme that with efficient sluice boxes and the latest

amount of gravel having been carefully prospected, it can be estimated down to almost the last ounce of gold that can be taken out of the property."

RADIOGRAPHY IN PEARL FISHING

The products of the sea are commonly wasted to a very deplorable degree by those who gather and use them, says the *Scientific American*. In no instance is this waste more marked than in the search for pearls. By the old method, which is still in vogue as a general rule, an enormous number of the so-called oysters are taken from their habitat and destroyed without any thought of economy. It is said that only one pearl is found in 100 oysters, and only one per cent of the pearls found are of any commercial value. Thus some 10,000 of the precious mollusks are sacrificed for every useful pearl obtained. Among these victims there must be a vast amount of immature pearls or seeds, pearls *in posse*, which might grow and become valuable gems, which are deprived of that possibility by premature destruction.

In the year 1901 Prof. Raphael Dubois took radiographs of pearls *in situ* within the shell of *Unio prolifera*, and obtained a clear view of their size and situation in spite of the thickness of the shell in which they were incased. He showed these radiographs at the Linnean Society of Lyons, and remarked that the X-rays might receive a novel application if used in the fisheries of Ceylon, and the destruction of a vast number of the prized mollusks might thus be avoided.

The difficulty of applying the X-rays to many thousands of shells *per diem* seemed sufficient to deter the ordinary person from such a laborious attempt. However, a few years later an electrical engineer of New York, Mr. John J. Solomon, who took an interest in the question of pearls, was struck by the same idea of using the X-rays to detect the existence of pearls within the shell of the living animal. He was then unaware

of the earlier experiments of Prof. Dubois but promptly set himself about the work from a commercial point of view.

In reviewing his work, *Nature* states that he found that an exposure necessary to obtain a good picture did not in any way injure the animal, and even an exposure of ten times as long could be applied harmlessly. The dangers lay rather in the removal of the bivalve from its normal attachment and in the time required for its transit from its bed to the laboratory of the photographer; for the pearl oyster is really a kind of mussel, which holds on to some fixed object by a brush of fibrils (*byssus*) growing from its body.

Thus the fundamental principle of Prof. Dubois, to save the life of unremunerative bivalves, bids fair to be carried out by American ingenuity and capital.

For practical purposes, where many thousands of shells have to be radiographed daily, a completely novel kind of plant had to be devised. This was done, and final success was considered to be well in view, when one hundred clear radiographs could be taken on an average every fifteen seconds. Mr. Solomon often succeeded in taking as many as five hundred per minute. In this process some hundred shells are exposed at a time to the rays. The oysters, spread on trays, are carried under the specially constructed cylinders by means of an electric motor. These great cylinders are cooled by means of suitable water jackets, and can thus be kept working continuously.

The oysters in which there is no sign of pearl formation are put back to their beds. Those in which good-sized pearls are detected are removed and opened, and the pearls promptly utilized. Those showing no pearls of adequate commercial value, but containing promising seed or immature pearls, are carefully placed in hospital. This hospital has rather a novel object; not the cure of the pearl disease (for the much prized gem is but a pathological growth), but, on the contrary, everything is done to keep the mollusk in *statu quo ante* so that the disease may progress as rapidly as possible to the production of valuable pearls and to the death of the incurable patient.

The question seems to arise, can the normal, or perhaps we should say, the abnormal, conditions of the pearl-producing bivalve be well enough imitated in captivity to insure the continued growth of the pearls? May not the "change of water" (as they must be kept nearer the surface) secure for the sufferers immunity from their diseased process? One might have imagined that a greater amount of sunlight, more oxygen, altered temperature, different nutrition, lessened pressure, and other changed conditions we think not of, would so influence the life of the mollusk that it might depart from its pathological but useful habit of producing these valued round bits of shell material, and the hospital might thus become a true *Kur-Anstalt* instead of a pearl-breeding depot. But Mr. Solomon tested these points, and he has satisfied himself that, if he can be certain to transmit in all circumstances the oysters to and from his laboratory without injury to their well-being, all other difficulties have already been overcome. As to the lucrative commercial value of the undertaking, time alone can tell; sufficient has not yet elapsed to make it demonstrable by actual proof that pearls can thus be hatched *en gros*.

CHINESE INVENTED WIRELESS.

The announcement is made that a Chinese resident of Canton, named Hu Chuen, had patented a new method by which wireless results in telegraphy were made more simple than by former patents. At a test of the equipment at Canton it was pronounced a success. It is recommended by the Chinese authorities for the reason that it can be manufactured from domestic materials, costs less than the imported article and is simpler to operate.



HANYANG IRON & STEEL WORKS

THE HANYANG IRON AND STEEL WORKS

Recent advices from Peking announce that, at the end of May, the shareholders of a Syndicate with a capital stock of Tls. 30,000,000, organized to amalgamate the Taiya Iron Mines, the Hanyang & Steel Works and the Pinghsiang Coal Mines, would meet to conclude all the arrangements. This amalgamation marks the beginning of an important era in the manufacturing industry of China and is of special significance to the steel trade in view of the extensive plans for railroad construction in China and the purpose of the Syndicate to supply the steel and rolling stock for these lines as they are being constructed. There are also indications that, if the plans of this large company are successful, the export of Chinese manufactured steel and iron to compete in the world's markets is not far distant. Of special interest therefore is the history of the development of the Hanyang Iron & Steel Works, at Hanyang, in the province of Hupeh, the nucleus of the present amalgamation which will concentrate the combined energy to mine the coal and the ore and turn it into the finished product.

In 1890, the first sod was turned on the present site, but it was not until three years after the first installment of machinery and furnaces arrived that the installation was completed. Then more delay followed over the difficulty of securing the necessary fuel. In fact the entire province of Hupeh was prospected with a view to securing coking coal without success, and the coke had to be secured in Europe.

In 1896, arrangements were made with Sheng Kungpo, the head of the China Merchants Steam Navigation Company and the Telegraphs, so that the latter took over the management. His first move was to prospect for a supply of coal and succeeded beyond his expectations in the discovery of the Ping-siang coal fields, located near the boundary of Hunan in Kiangsi province which have been worked with most satisfactory results.

Sheng Kungpao was not so successful with the iron works and finally he decided that more modern machinery and skilled management were necessary to the success of the enterprise. He sent to Europe and America a committee comprised of V. K. Lee, general manager of the works, Mr. Thomas Bunt, M. E., M. I., one time president of the Shanghai Society of Engineers and who assisted in the installation of the plant in the Kiangnan Arsenal, and Mr. Gustavus Leining, chief engineer of the colliery. This committee took with it samples of ore, product, etc., and after a thorough investigation of all the processes in Europe and America, reported favorably upon the installation of a modern plant, and this they proceeded to do on the site of the original works.

The process used is the Open Hearth (Siemens-Martin), and all kinds of structural steel used for every kind of shipbuilding, architecture, bridge material and railway steel are manufactured.

The plant running at its full capacity will consist of three blast furnaces turning out a maximum of 450 tons daily; three Open-Hearth furnaces with a capacity of 30 tons each; one metal mixer of 150 tons capacity; one cogging mill; one beam and angle mill; one plate mill; one gas-fire soaking pit with a capacity for rolling 1,000 tons of finished product daily.

In conjunction with the works are the coal and iron mines capable of supplying the iron ore and good coking coal indefinitely. The They a mine can furnish one million tons of ore annually according to the estimate of experts, and the Pinghsiang mine is capable of supplying the same amount of coal annually. A railroad 15 miles in length carries the ore and another line 60 miles in length carries the coal from the mines to excellent waterways where it is loaded on vessels owned by the company for transport to the works. There are about 1,000 workmen employed

and the administration is conducted by a staff of officials numbering about 140.

It is estimated that on the average about 5,000 tons of pig iron is exported every month, mostly to Japan, and one shipment is recorded having been shipped to the United States.

Of this shipment, Consul General Denby of Shanghai has the following comment: "The only shipment to the Atlantic Coast of which I have been able to obtain definite knowledge is a cargo of 1,500 tons shipped on July 5, 1907, from Hankow direct to Brooklyn. The price laid down in Brooklyn is said to have been \$17.50 gold per ton, including freight, \$4.75 per ton from Hankow to destination.

"This event is indicative of such far-reaching potentialities that it merits the attention of the iron industries of the United States. The carrying of such a commodity as pig iron 600 miles down the Yangtze river, from Hanyang to the sea, and then 14,000 miles farther via Suez, and laying it down at New York in competition with American prices, is in fact a striking instance of modern trade development. This, of course, is only possible through the fact that ocean-going ships can reach Hanyang with eighteen feet draft at almost all seasons of the year, permitting the carriage of cargoes of about 2,000 tons without trans-shipment and to the fact that iron is found in great quantities in China, and produced under favorable conditions as to coal and labor."

With the exception of the rolling mills, all the machinery is driven by electric power, and electric lighting is provided for every section of the works. These plants were supplied by The Siemens-Schuckertwerke, The Lancashire Dynamo & Motor Co. and Messrs. Ballis and Marcom.

In connection with the railway supply, a company known as the Yangtze Engineering Works, Limited, is establishing a plant in Hankow to manufacture and supply bridge material, railway trucks, coaches, etc.

While the output of the works for 1907 did not exceed 70,000 tons of pig iron, it is estimated that with the complete equipment in operation, the output for 1908 will reach 150,000 tons of pig iron. Managing Director Lee is still in charge of the works. He is a native of Kiangsu and has been associated directly with the remarkable history of the institution. To his personal efforts is due the present promising condition of the works.

Among the firms who furnished much of the machinery for the plant are Messrs. Davy Brothers, Daniel Adamson and Co., Kraven Brothers, Roberts, White, Gebroeder Klein, Bechem and Keatman, Hamil and Lueg, and Wellman-Seaver-Morgan and Co.

In connection with the formation of the big syndicate, the following announcement was recently made from Peking by the correspondent of the *North China Daily News*:

"According to an Imperial Rescript H. E. Sheng Kung-pao, newly-appointed Junior Vice-President of the Ministry of Posts and Communications, and Imperial Commissioner of Tariff Revision and negotiations with Germany, Italy and some other lesser Western Powers, has already obtained sanction from the Chinese Government to form a big coal and iron corporation in the Yangtze valley, with its head office at Hankow. The new company will be an amalgamation of the steel and iron works at Hanyang, the iron mine at Tayeh, both in Hupeh Province, and the coal mine at Pinghsiang, Kiangsi, with a paid-up capital of Tls. 10,000,000 which is to be divided into 100,000 shares of Tls. 100 each, while its subscribed capital will be Tls. 20,000,000. As in all other Chinese enterprises at the present moment, the subjects of foreign countries are strictly precluded from becoming shareholders of this corporation. Judging from the report of H. E. Sheng, who was previously Director-General of the three companies named, the corporation has

certainly a prosperous future before it, if its affairs are properly administered. The main object of the promoters of the corporation is to develop coal and iron mines in central China with pure Chinese funds without assistance from foreigners whatsoever."

MINES AND MINERALS OF MANCHURIA

An interesting review of the mineral wealth of Manchuria has been made by Mr. J. B. Sutor, trade commissioner representing New South Wales, in his report on that section of the Chinese Empire which will prove of interest to mining men and capitalists interested in the development of mineral deposits in Eastern Asia: and follows—

"The whole of the eastern seaboard of Manchuria, as well as portions of the north and north-east, is hilly country, probably 200 miles or more wide on the east, while in the north there is more undulating country in between the mountains. It is reported that gold, copper, silver, and lead exist in large quantities, principally to the north of Korea. When at Mukden I had the pleasure of meeting an old Australian friend, who is a mining engineer, and who has recently visited many parts of Manchuria. At the time of meeting, my friend informed me that he was then on his way to bring a party of English mining experts to examine undeveloped country in the south-east, to the north of Korea and on the watershed of the Yalu. I inquired as to whether the minerals were as rich as represented, to which he replied that many of the mining concessions were over-estimated; at the same time, the future was likely to reveal great developments.

To the north of the Yalu, and in the province of Kirin, there are roving bands of murderers and robbers, and if there is one blot on Chinese administration, it is the lawless state of affairs that is permitted to exist, not only in Manchuria, but also in the north of China. Probably the most blood-thirsty wretches are to be found at the places named in Manchuria. So far, they have not molested foreigners so much as their own nationals. A few days before I travelled north the train was "held up," and several of the Chinese passengers killed. The Japanese authorities, so far as the railway is concerned, are now taking such precautions that such bold attempts are not likely in future to be so successful. In the extreme north of Kirin, and about that part of the country occupied by the Siberian railway to Vladivostok, a worse state of affairs exists. The Chinese robbers (Hungtutze) are evidently hand-in-glove with Russian criminals of the lowest type, who are infesting the country in all directions. A few days ago the mounted bandits fired into the Russian express and killed one of the passengers—this in spite of the fact that each train carries a certain number of soldiers armed and with fixed bayonets. At all centres where mining for gold or silver is carried on a similar reign of terror exists. Lately the Chinese Government, always slow to action, have been prevailed upon, and to-day have over 15,000 troops in Northern Manchuria to preserve order and endeavour to capture the ringleaders or robbers. When they are fortunate enough to do so—purely by the merest chance—short work is made of the robbers. In my opinion the Chinese methods of capture are a burlesque. I have seen small bands of soldiers marching about on foot in the open—they do not appear to leave the beaten tracks—and they make their marching so conspicuous that the robbers evidently find it an easy matter to avoid capture. Again, the villagers are so hand-in-glove with the mounted bandits that they have ample information in advance of the troops. Many of the supposed bandits have recently been executed; but foreigners often remark that when the Government send out an expedition some good

results must be shown. Therefore, if they cannot arrest the individual they are after a substitute is often procured and decapitated.

"Under conditions such as these, gold and silver mining operations are being carried on which are not looked upon as paying concerns, in consequence of the cost of protection to vested interests, and the maintaining of law and order—though the latter exist, I fear, in name only. Under settled conditions, it would appear that prospects are very encouraging, and that Manchuria will yet produce a vast amount of gold, silver, lead, and copper. The gold so far obtained is from the alluvial deposits, principally in the far north and on the Amur

as follows from the nearest ports of shipment, viz.:—

Seaport.	Miles.
Yingkow (also known as Newchwang) to Endai.....	86
Port Arthur to Endai.....	241
Dairen (also known as Tairen) to Endai.....	220
Yingkow to Mu-tsi.....	186
Port Arthur to Mu-tsi.....	291
Dairen to Mu-tsi.....	271

OPENING OF WESTERN CHINA

Consul Mason Mitchell, reporting from Chungking, gives the following information of the little-known region of western China and the Tibetan borderland:

Tatsienlu, in the province of Szechwan western China, is the last town before reach-

in both sexes. The males have tusks protruding from the lower jaw to a length of 3 inches. The species is known as the *Moschus sifanicus*.

Next in importance of exports is wool. This trade of late has diminished, owing to the disturbances on the border. The coarse sack-like wool cloth "mu-tsz" is worn by all Chinese coolies, while a fine grade dyed red called "pulu" is the clothing of the higher class of the Tibetans. The lower classes, such as yak and pony drivers, wear entirely undressed sheepskins. About 45,000 pounds of wool is received annually in Tatsienlu.

GOLD MINING—TEA AND AMERICAN DRILLS—NEW RAILROAD

Gold is known as "Huang huo" and is brought for sale in form of dust, though sometimes nuggets are found. From 5,000 to 7,000 ounces come to Tatsienlu annually. But little profit is made there, as it brings only \$20 to \$24 per ounce. The Tibetan confines mining to washing the alluvial sand in the river beds. He is averse to outsiders mining in his country, his antipathy to them being very great. The Tibetan wishes to be let alone and strongly resents foreign intrusion.

The exports from western China into Tibet consist almost entirely of tea. The shipments via Tatsienlu come principally from the town of Yachow, in Szechwan Province. The tea packages are made up in rolls about 3 feet long. Each carrier will take on his back from five to thirteen, according to his age and strength. The annual value of the trade is somewhat over \$750,000. The taxation amounts to 20 per cent, the bulk of which goes to the salt and tea taotai at Chingtu, the capital city of Szechwan Province. There is also a small amount of American drills dyed in Yachow going forward for the Tibetan market.

A French railroad is in course of construction from Pakhoi, on the Gulf of Tongking, to Yunnan, the capital city of the province of that name, in the southwest of China. When completed it is proposed to extend it to Batang, a distance of about 400 miles. If this is done it will give eastern Tibet and western China an all-rail route to the sea and divert the traffic from the long and laborious route via the Yangtsze River. From Batang to Suifu, the head of navigation of the Yangtsze, is a march of thirty-two days over the mountains, some of which are 15,000 feet in height. From Suifu to the mouth of the Yangtsze at Shanghai is a distance of 1,600 miles, including the gorges and rapids of the upper part of the river.

NEW PUBLICATIONS

Telephone Construction, Installation, Wiring, Operation and Maintenance, by W. H. Radcliffe, E.E., and H. C. Cushing, Jr., E.E., is an interesting volume that will prove of special interest to the amateur interested in the installation of small exchanges. It might be called a primer for those without the slightest knowledge of telephony and 125 illustrations are included to make every step clear to the student. The volume is published by the Norman W. Henley Publishing Co. of New York—Price, Net, \$1.00.

McCluskie's Indian Directory and Guide for 1908 has been received and maintains the high standard of this publication now in its third year. Among the desirable improvements and additions are two useful alphabetical lists of the principal residents throughout India and Burma, both Foreign and Indian.

The Indian Trade Index, one of the most valuable features of the directory, has been thoroughly revised and enlarged and will be found of great value to the importer and exporter in every section of the East. The volume contains a comprehensive map each of Calcutta, India, and a produce map of Bengal. Published by the Baptist Mission Press, Calcutta. Price, Rs. 8.



RUBBER NURSERY ON THE BATU PUTEH ESTATE, PROVINCE OF WELLESLEY, PENANG

and Sungari rivers, and is spoken of as fairly coarse, but not found in large nuggets.

"Iron, coal, and soda are extensively worked. The iron deposits are about forty to fifty miles to the north of Mukden, and would appear to be extensively worked in quantities to meet local requirements, but not, as yet, for export, owing to the lack of facilities.

"In the southern portion of the north-western province of Heilungchiang large quantities of soda are obtainable and exported in cakes to Southern Manchuria and other northern parts of China, where it is extensively used in dyeing establishments, and also to dissolve the gum of cocoons in connexion with silk reeling.

"Coal has been found in several places in Manchuria—viz., at Feng-t'ien, in the province of Liaoyang, known by the Japanese as Endai [Yantai?], also north and north-east of Mukden, the principal deposit being at Mu-tsi (Japanese name, Budzun). As regards the deposits in the district of Mu-tsi, the following will convey a rough idea of the coal available:—

Senkinsai	Seam 3,960 ft. wide.
Hakuho	" 4,800 "
Rokodai	" 3,300 "

"The most important deposit is at Senkinsai, the total estimate of available coal at the three places being about 300,000,000 tons. Other deposits exist close by at a place known as Kodioshi, on which an estimate has been formed that 140,000,000 tons are available for recovery, thus giving a grand total of 440,000,000 tons for the Mu-tsi district, near the ancient capital of Mukden, a branch line of railway having already been constructed from Eokaton, on the Manchurian railway, thirty-four miles easterly to the district of Mu-tsi. A much inferior coal has been found near the city of Kirin, in the province of that name. The deposits so found are distant

ing the Tibetan border. It is situated at an elevation of 8,400 feet, in the high mountains that extend through western China into Tibet. To reach Tatsienlu from Chungking it requires twenty-one days and from there to the Tibetan line eighteen additional days, the route crossing mountain passes over 15,000 feet high.

Until the present dynasty the Tibetan boundary line extended as far east as Tatsienlu, but under the 'present régime it is now drawn eighteen days' travel farther west, at the town of Batang. As this border strip of territory is mostly populated by Tibetans, they are under the jurisdiction of 3 Tibetan kings, each having his district, but all under the sovereignty of the Chinese Government.

Tatsienlu is a small town, with low wooden houses and a population of 9,000, mostly Tibetans. Its strategical and commercial importance is due to being the gateway to Tibet and the high plateaus to the northwest. In this district are the splendid grazing pastures, where a fine quality of wool is produced. Farther on is the Tachin River, which forms the boundary between eastern Tibet and one of the aboriginal Chinese tribes called the Mantzu.

A large trade is done here in rhubarb and musk, the latter taken from the small hornless deer plentiful in this part of China. Of the exports of this district musk is the most valuable, the price of the medium quality being thirteen times its weight in silver.

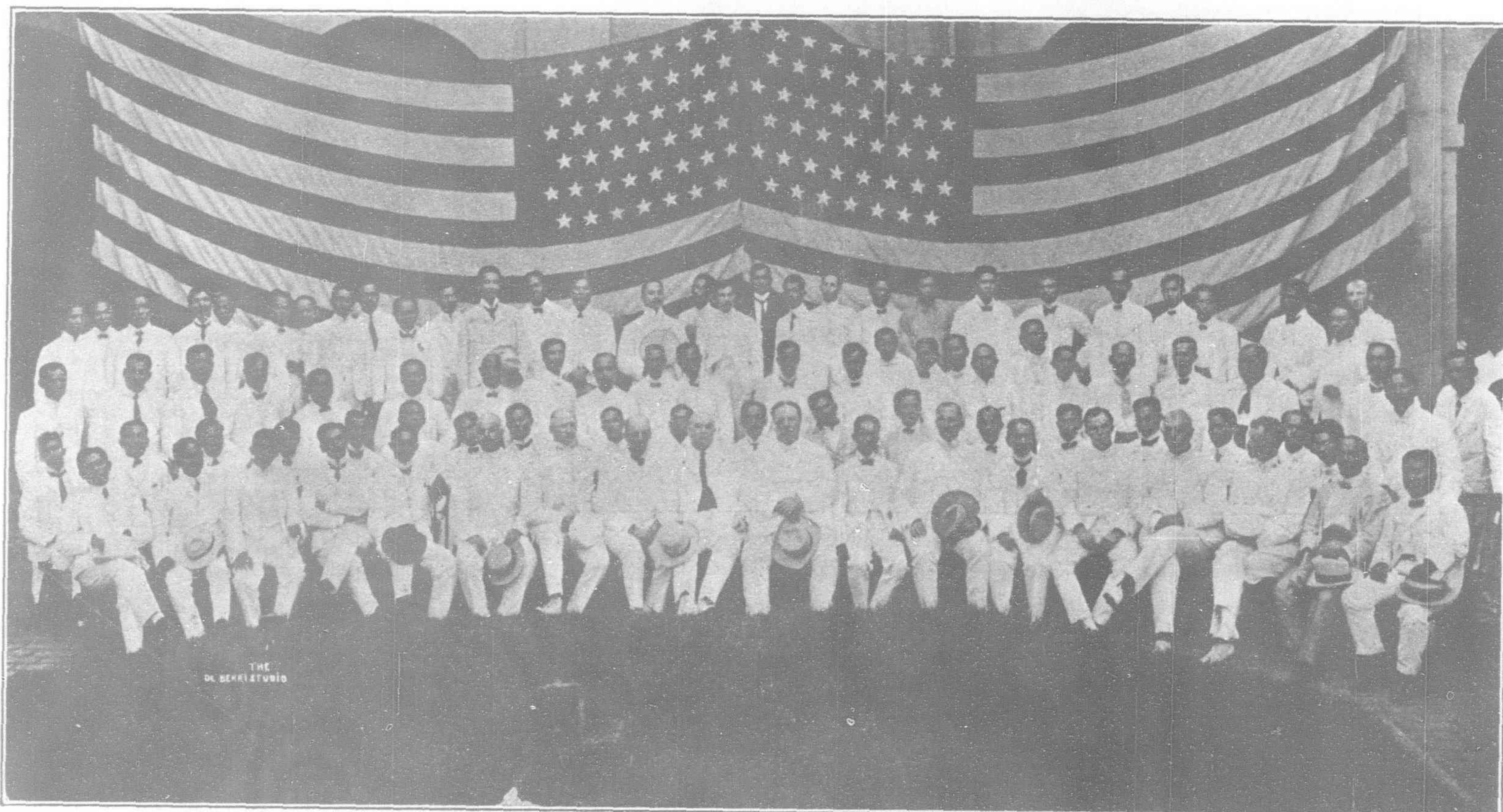
The product is obtained from a sac-like gland in the abdomen. It is carefully dried and sewn in small bags, called musk pods, of 1 ounce each, made from the skin of the animal. The musk deer of north-western China is an allied species and is only found at an elevation over 8,000 feet. It stands about 20 inches at the shoulder, but its chief characteristic is the absence of antlers

A NEW APPARATUS FOR SUBMARINE OPERATIONS.

That which makes deep-sea diving dangerous is not so much a question of furnishing the diver with air, but the difficulty of protecting him from the weight of the overlying water, says the *Scientific American*. Each foot of descent increases the pressure on every square inch of his body by nearly half a pound. A depth of

and line, but by a large vertical standpipe, which he may climb at will. The new apparatus comprises a caisson, or operating chamber, fitted at the top with a large collapsible tube or shaft, which extends to a float or barge at the surface of the water. The shaft is made up of a series of sections terminating in flanged rings, whereby the sections may be bolted together. Each section consists of a flexible covering stretched over a series of metal rings of I-shape

reach out and conduct the ordinary operations of the diver, while fully protected within the operating chamber. Articles that are to be lifted to the surface may be attached to grappling irons let down from the barge. To facilitate the work, electric lights may be lowered into the water outside of the operating chamber. When it is desired to move to a new spot, the chamber is lifted sufficiently to clear the bottom, and the barge may then be towed to the proper position.



REPRODUCTION OF A PHOTOGRAPH OF GROUP INCLUDING SECRETARY TAFT, THE MEMBERS OF THE PHILIPPINE COMMISSION, GENERAL EDWARDS, CHIEF OF THE BUREAU OF INSULAR AFFAIRS, THE EXECUTIVE SECRETARY AND THE MEMBERS OF THE PHILIPPINE ASSEMBLY

100 feet develops a crushing pressure per square inch of 43 pounds, or a total of as many tons on the entire body of the diver. Naturally, such being the conditions, the diver's profession is not overcrowded. Few men can stand the strain of a 100-foot submergence, and many dare not venture below 50 or 60 feet. As occasion often arises when it is imperative that work be done at greater depths than these, efforts have been made of late to provide divers with metal suits which will completely protect them from dangerous water pressures.

An entirely new method of conducting work in the deep sea has been devised. The advantages obtained by this method are that the diver is protected in every way, and is at the same time in free communication with the surface. He breathes air under normal pressure, and is free to ascend or descend at any time without having to give a signal to operators above. Furthermore his connection with the surface is not maintained by means of a slender tube

cross section. By means of the chain hoist connected with the top of the operating chamber, the apparatus may be lifted up to the surface, collapsing the vertical shaft and permitting the operating chamber to rise into a housing in the barge. As the apparatus is raised the sections are unbolted and stowed away.

The operating chamber is entirely sealed, except for its connection with the tube. No air pumps are necessary, as free communication with the outside air is had through the open vertical tube. The chamber is provided with glass-covered windows, through which the surroundings may be examined. The side walls of the chamber are formed with protruding parts, which are furnished with windows on all sides, and serve as helmets for the operators. Armholes in these protruding parts are fitted with sleeves of flexible material. In use the operators climb down the vertical shaft, using the stiffening rings as a step ladder, and when in the operating chamber they can by means of the sleeves

The lower sections of the tube are somewhat collapsed, as compared with the upper sections. This is due to the pressure of the water at the bottom; and owing to this collapsed condition the sections are heavier near the bottom, and consequently serve to weight the apparatus and hold the tube vertical.

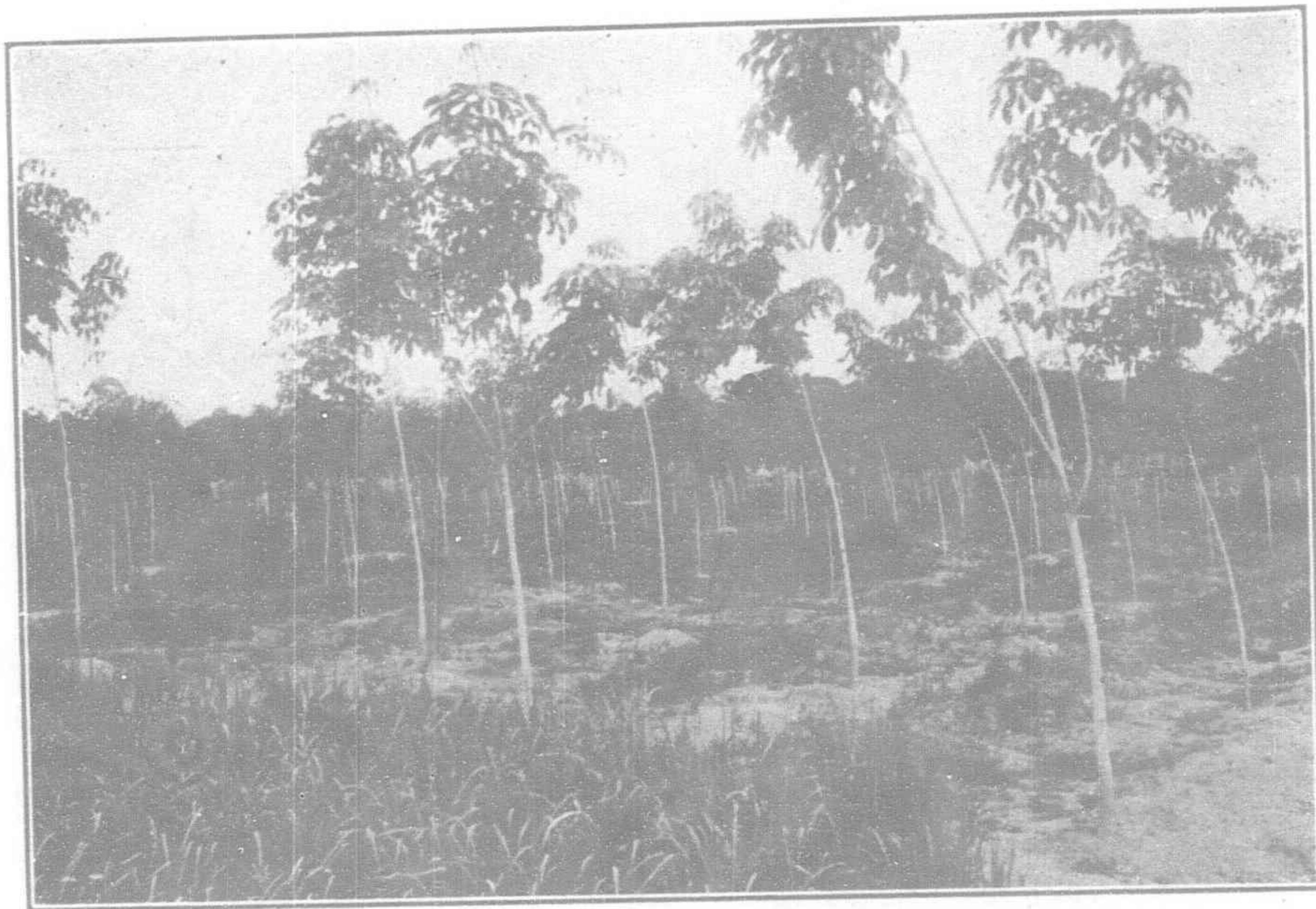
An experimental apparatus of this type has already been tested in the James River by the inventor, Charles Williamson. To be sure, the fact that the operating chamber is not free to travel about without moving the barge, limits the field of its operations. However, there should be many conditions under which it could be used to advantage.

The device may be used alongside a vessel to provide access to the exterior of the hull for purposes of making repairs or cleaning off various marine growths. Aside from its advantages for diving operations, the apparatus may be used at amusement parks to furnish visitors with a view of under-water conditions or for exploring the bottom of a river or other body of water.

MINERAL RESOURCES OF INDIA

The rich mineral resources of India are rapidly being developed and there is prospect that the next few years will show a remarkable expansion of this industry. In fact during the last two years the number of prospecting licenses has been increased from 30 to 50 per cent. A correspondent has reviewed the mining situation in the *Capital*, the well known financial journal, and includes in his article the following comparative table

territory, where the production in 1906 was about 468,000 tons. In Assam it amounted to 285,500 tons. In other parts of India there has been some decline, especially in the Central Provinces, but the output of this region is certain to increase greatly in the near future. In spite of the partial falling off just noted, the total Indian output in 1906 was 16 per cent. above that of 1905, while the value was 35 per cent. higher. There has been a general improvement in the quality as well as the quantity of the



TWO-YEAR OLD RUBBER SEEN ON THE BRIEH ESTATE, PROVINCE WELLESLEY, PENANG

which demonstrates the development made in the ten years ending 1906:

MINERAL.	1906.	1896.
Coal	Tons 9,783,250	3,863,700
Gold	Oz. 581,545	324,475
Petroleum	Galls. 140,553,000	15,019,000
Manganese Ore	Tons 495,700	56,900
Mica	Cwt. 51,430	12,830
Rubies	Carats 326,855	136,330
Salt	Tons 1,225,280	1,024,750

COAL.—Although the first coal mine was opened in Bengal in 1820, the great majority of the mines now worked were not open 20 years ago, and the real development of the industry hardly began till about ten years ago. The output has risen from 1,388,500 tons in 1886 to 3,863,700 tons in 1896 and 9,783,250 tons in 1906. India now stands at the head of the coal-producing dependencies of the British Empire. The actual amount of capital invested in coal-mining cannot be stated, but four of the largest joint stock concerns have a combined paid-up capital of £568,000, while the total capital of the limited liability concerns alone has been estimated at £3,250,000. During the past year there has been much speculation in Calcutta—shares have gone up in value and many new companies have been floated. The progress of the industry is handicapped by the lack of an adequate supply of specialized labour, but the prospects of high wages may in time wean from agriculture a sufficient force of natives and a sort of coalmining caste may gradually be formed. About 100,000 persons are daily employed at present, of whom two-thirds are men. By the aid of improved mechanical appliances the output per person employed below ground has risen from 101 tons in 1901 to 145 tons in 1906. Of the coal won in India in 1906 no less than 88 per cent came from Bengal. The Jherria field, opened in 1893 and now the largest producer, was responsible in 1906 for 4,065,607 tons, and the Raniganj field for 3,650,560 tons. Thus these two fields alone account for nearly four-fifths of the total Indian outturn. Outside Bengal the most important mines are those at Singarni, in the Nizam's

output in recent years. This has been accompanied by rapid growth in the exports, which last year represented 9 per cent. of the production. Almost all the exported coal is shipped from Calcutta, and the principal external markets are Ceylon and the Straits Settlements, which in 1906-7 absorbed 43 and 31 per cent. respectively of the total shipments. Imports of coal into India in 1906-7 were only 257,000 tons. The coal consumption in India itself is distributed roughly as follows:—Railway consumption, 2,700,000 tons; bunker coal (including river steamers), 1,450,000 tons; jute and cotton mills, 1,110,000 tons; other forms of consumption, 2,965,000 tons. The railways consume about 30 per cent. of India's whole output, while only 1 per cent. of what they burn is imported. Nearly all the steamship lines that touch at Indian ports use Indian coal mostly unmixed. As the coal is worked near the surface and labour is cheap, Indian coal has a lower value at the pit's mouth (3s. 11d. per ton in 1906) than that of any other country. The enhanced demand in 1906 made the trade abnormally active and caused a considerable rise in prices. Improvements in loading and despatching the mineral are required in order that the ever-growing demand may be promptly met.

MANGANESE ORE.—The Indian manganese ore industry began about 15 years ago with the quarrying of deposits in the Vizianagram State (Madras). The output rose from 3,130 tons in that year to 92,458 tons in 1900, when richer deposits were attacked in the Central Provinces, which now yield far more ore than the Vizianagram mines. The low range of market prices placed a temporary check on production in 1903 and 1904, but in 1905 the output rose from 150,297 to 253,896 tons, while in 1906 the production reached the high figure of 495,730 tons, or nearly double that of the preceding year. The chief factors in this remarkable growth were the temporary cessation of the manganese industry in the Caucasus, and the activity of the steel manufacture in the United Kingdom, United

States, and Germany. The unprecedented demand caused a great rise in prices. Low grade ores that were sold at a profit in 1906 would not have paid the freight charges in 1904 and the early part of 1905. Thus the unit value of manganese ores carrying over 50 per cent. Mn. at United Kingdom ports in 1904 was only about 9½d., while at the close of 1906 it was 1s. 4½d. This advance in prices stimulated the production of lower grades of ore. There was great activity in prospecting, and new quarries were opened. Owing to the fact that the deposits are rich and easily worked, India has become the largest producer of the ore, having outstripped Russia and Brazil. There seems little doubt that she will maintain the firm hold she has secured in the world's market. In the Central Provinces the ore is raised mainly in the Nagpur, Bhandora, and Balaghat districts, where the grade is very high, ranging from 51 to 54 per cent. of metal. Its high quality enables this ore to bear the heavy rail freight of 500 miles, besides the cost of shipment to Europe and America. Other important sources of ore are Vizianagram, the native States of Mysore, Sandor, and Jhabua, and the Panch Mahal's district of Bombay, while finds have recently been reported from Lus Bela State. The Carnegie Steel Company is said to have acquired a large deposit in the Balaghat district, while a property in Mysore has been purchased by a German firm. The revival in the Caucasus manganese industry and the depression in the American and German steel trades have caused a decline in prices, especially in the market for low grade ores. Thus in a year, the price of Mysore manganese has fallen off 40 to 50 per cent. The Indian exports of the ore have expanded from 282,000 tons in 1905 to 453,000 tons in 1906 and 581,000 tons in 1907. There is talk of establishing a reducing plant in India, as the present method of shipping crude ore involves heavy payments for freight of waste. The superior Indian ores are specially suited for the manufacture of ferro-manganese and spiegeleisen. Many of them have not only a high percentage of manganese, but also a low percentage of phosphorus and a low humidity. Last, and not least, the Indian mines have a good reputation for faithfully executing their contracts.

PETROLEUM.—The important Burma oil-fields form part of a belt extending from Assam to the Dutch Indies. The oldest, most developed, and most successful of the Burma fields is that of Yenayaung, in the Irrawaddy Valley, where native wells have been in operation for a century. Drilling was started in 1887, and the output, which had been only 2,000,000 gallons in 1886, rose to 40,000,000 gallons in 1902, and to no less than 89,500,000 gallons in 1906. The next largest of the Burman fields are the Singu (opened in 1901) and the Yenangyat (1891), which produced 35,000,000 and 13,000,000 gallons respectively in 1906. The local value is estimated at about 1d. per gallon of crude oil. In Assam the oilfield produces about 3,000,000 gallons a year. In India (excluding Burma) the consumption of Burma and Assam petroleum has largely increased, and, whereas eight years ago the proportion of Indian to foreign oil consumed was 5 and 95 per cent., the relative proportion in 1906-7 were 53 and 47 per cent.

GOLD AND RUBIES.—In British India the production of gold is insignificant. In 1906 no less than 97 per cent. of the total Indian output—viz., 581,545 oz., valued at £2,230,284 came from a single reef in the Kolar district of Mysore. The Nizam's Hulti mine yielded 13,784oz. Gold washing is carried on in many districts, but no record is available of the amount thus obtained. The only company working for rubies on a large scale is the Burma Ruby Mines (Limited), but there are numerous mines and washings in the Mogok district, worked by Burmans possessing hereditary rights, and from these are obtained large quantities of gems, including some of great value.

THE NEW SHANTUNG RAILWAY

A correspondent of the *Celestial Empire* gives an interesting and comprehensive review of the progress in railway construction in Shantung and the industries affected thereby in the section traversed. The correspondent writes:

"Known as the Tai-tsao Railway this line, something over 80 li in length, is projected to run from the coal mines 20 li north of Yih sien down past that City to Taierchwang, the leading port of South Shantung on the Grand Canal.

"**TSAO-CHWANG.**—Is an ordinary Chinese village of a couple of hundred families remarkable for nothing else than that it gives its name to the mines in the near vicinity. The town of note in the vicinity is Ch'i tsun. This is a place of some 800 or 900 families, famous in all the region round about for its potteries. The great Kang water jars, used also for holding grain, some of them considerably larger than a flour barrel, are made here, while bowls and small jars are made by myriads. There are 13 kilns and each one of them can turn out between \$600 and \$700.00 Mex. worth of products per month. Nearly all, of indeed not all, the kilns are controlled by one very wealthy family of which one of the members is a Hanlin and a Censor, Tsui by name. This town shares with Yen Hsien, in Central Shantung, the pottery trade of this section.

"**YIHSIEN.**—Is a trim little city attractively located at the opening of a valley. It was formerly spelled Ihsien and so appears in the Bond advertisement of the Tientsin-Pukou railway where it is mentioned as the point where the German section of the railway connects with the British section. The P. O. has changed the spelling to avoid confusing the place with an Ihsien in Nganhwei. The city is prosperous but is not higher than a third rate district city as regards size and trade.

"**TAIERCHWANG.**—This is a place of about 600 families. It has a brick wall surrounding it and one very fair business street. It almost supports a telegraph office and has also a C. I. P. O. with daily mail from the South. It is eight days stages by boat from Chinkiang, that is something over 700 li. Here is an office for the collection of revenue from boats, here is another office established by the Board of Commerce, Industry and Agriculture to see that the other office does not unduly oppress the boatmen and traders. The following are some of the principal distances from Taierchwang:

S. E.	via Canal to Yaowan	110 li
"	" " " Hsu Chien	180 "
"	" " " Tsingkiangpu	360 "
"	" " " Chinkiang	720 "
N.W.	" " " Hawchwang	83 "
"	" " " Hsia Chen	140 "
"	" " " Tsiningchou	360 "
N.E.	" land " Ichowfu	180 "
S.W.	" land " Hsuchowfu	110 "

"**THE MINES.**—It is plain from the above table that the outlook for the mines is very favourable. Tsining is the second largest city of Shantung, somewhat decadent now owing to the diversion of the grain transit from the Canal to the ocean but still a very large and by no means dead place. Ichowfu and Hsu Chowfu are flourishing cities of 60,000 or 80,000 population and centres of populous regions. Su Chien is a prosperous district city situated on the old bed of the Yellow River from which it draws sand for its glass-works. These are under the care of several Englishmen and use large quantities of coke. The road from the mines to Taierchwang is traversed by one continuous stream of barrows wheeling coke. I counted 50 in a couple of hours. Each barrow holds 600 catties and upward and the poor fellows receive about 500 small cash per day for their toil. Most of this coke, it is said, goes to the glass-works. Tsingkiangpu is one of the big towns of north Kiangsu.

"**THE OUTPUT.**—At the mines is at present two hundred tons a day. The coal is only

from two to three hundred feet deep and in places the seam is over 20 ft. thick. The coal is of excellent quality, bearing the reputation of being the most valuable deposit in the province. It is very largely used by the Chinese in the general vicinity for domestic purposes and has been of great use to them this present year on account of the high price of Kao-liang stalks and other vegetable fuel so extensively used in North China. There are thirteen shafts or rather holes now on the plot but at present only three are working. The coal is hoisted by a steam engine in rope baskets containing about 120 catties. The men go down for a 24 hours' shift and are paid by the basket,

will greatly solidify the embankments and in September the laying of rails will commence. The point at which delay is most likely to occur is at the 60 metre bridge crossing a small river at Yih sien. There are only three other bridges and they altogether do not exceed 70 metres in length. The grade is extremely easy, and there are two cuts and these very light ones on the entire line. In addition to the two termini and Yih sien, there will be but one other station, that at Ni-kou, a scattered village of some three hundred families half-way between Yih sien and Taierchwang. The material, that is bridges, rolling stock, rails, etc., comes through the firms of Arnhold, Karberg and Co., and Carlo-



TAPPING RUBBER TREES ON WILSON'S ESTATE, FEDERATED MALAY STATES

100 small cash per basket. They can if good workmen earn half a dollar for their long hard turn of 24 hours. Two of the thirteen holes are used for taking out the water which is brought up in big leather bags, by a steam engine.

"The coal is quite soft and is remarkable because of its freedom from lumps. About a hundred coke ovens are in close proximity to the mines.

"The premises are quite extensive probably three li long and two li wide. The concession granted by the Imperial Government to the company embraces a territory ten li square. The leading spirit of the company is Hon. Chang Lien-fen at present Salt Commissioner of Shantung. So far as now known coal is found within a region 70 li long by 40 li wide. Another Company headed by a rich Chinese of the vicinity, Mr. Liang, has another, but much less valuable concession near by. The plan is to introduce foreign machinery at an early date. A shaft will also be sunk 40 li N. W. of Tsao-Chwang within 10 or 20 li of the proposed line of the Tientsin Pu-kou railway. There is a great future for the mines as the railway will make such large use of their coal, no other mines being so conveniently within reach of it.

"It is almost a certainty that in the near future a railway will be built connecting the mines with the recently opened port of Haichow, in north-east Kiangsu. This will give the mines an outlet to the ocean. The real port is Ching Kou not Haichow. The line will be easy of construction, running a hundred miles through the fertile and populous Ichow-fu plain and touching that city.

"**THE TAI-TSAO RAILWAY.**—Is to be completed before the middle of next year. The work on 90 li of earthworks is well under way and will be largely completed before the rainy season of this year. The summer rains

witz and Co. It is said that the present concessionaire had to make a stiff fight at Peking to keep his prize from following the path of so much other mineral wealth of Shantung in passing under German control and that the matter was compromised by the arrangement that in the development of the mines German machinery should be used. It is generally supposed that there is also some German capital invested therein.

"The railway however is overwhelmingly capitalized by the Chinese, nearly all Shantung high officials being interested therein, Szechwan and Chekiang also being largely represented as well as capitalists in Shanghai and Tientsin.

"The Railway will be almost entirely a coal road. Eight cars and 3 locomotives have been ordered for this traffic, machine shops will be erected at Taierchwang and possibly some passenger cars built there. Limestone is abundant in the nearby hills and already sixty trucks and 10 li of light railway are piling in the necessary stone.

"The coal yard and wharf at Taierchwang will be a large affair. About 45 English acres have been purchased in a bend of the Grand Canal which bounds it thus on two sides. Along these two sides 700 ft. of wharfage stone masonry are being constructed while on the two remaining sides a circumvallating moat has been constructed which will admit boats from the Canal. The whole plot has been elevated 5 ft. above the adjacent territory.

"**THE CANAL.**—Is sadly in need of dredging. The German Mission of South Shantung has just bought a launch drawing one foot of water which will make the trip from Chinkiang to Tsining in four days. Just now, however, only boats drawing half a foot can navigate certain sections of the upper part of this route."

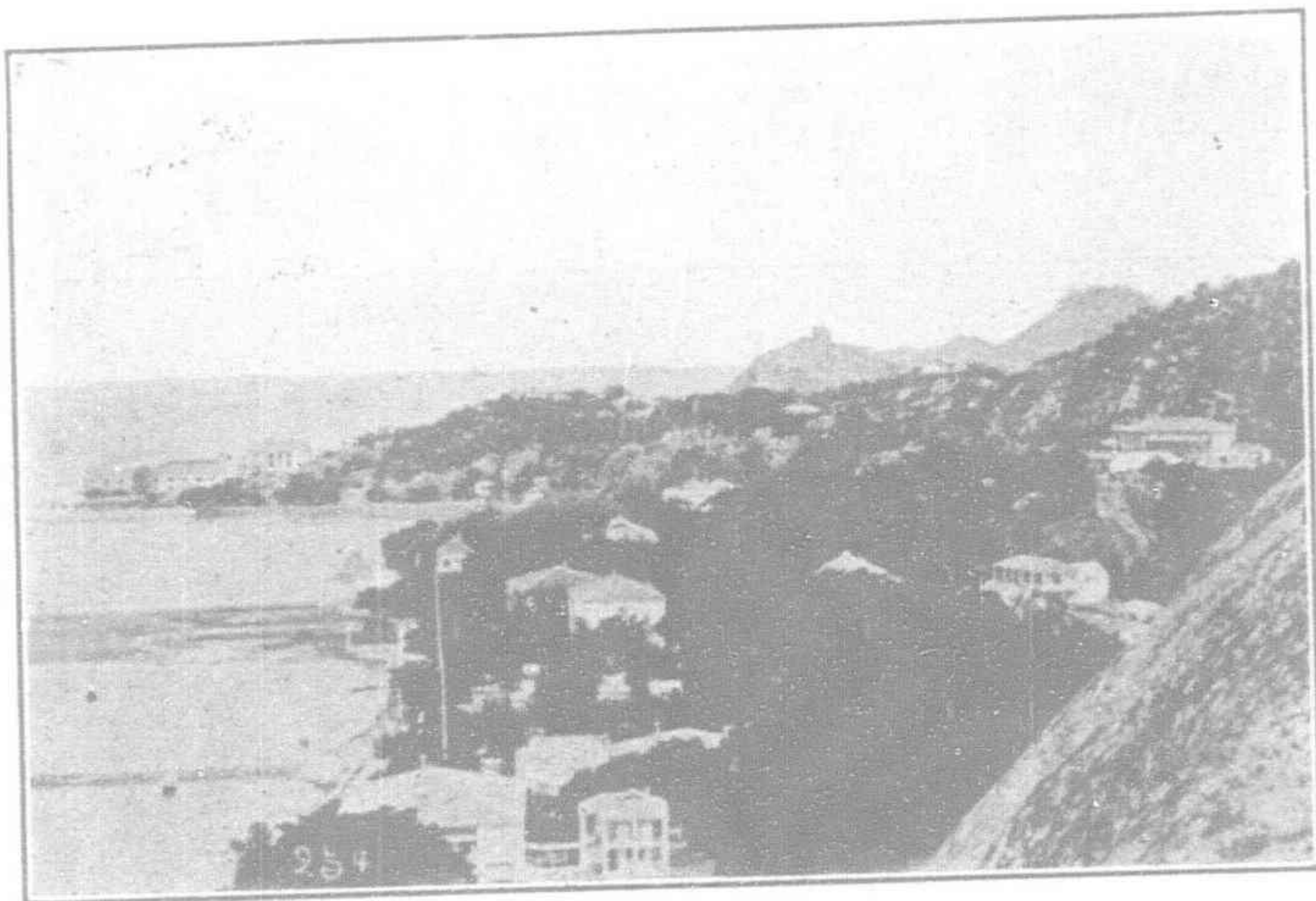
THE PORT OF SWATOW.

Swatow, in Kwangtung, has always had a great stand by in its export of sugar, but the cultivation of the cane has had a considerable check owing to cheaper sugar from Java imported into China direct, or after treatment at the three refineries in Hongkong. Cheap Javanese labor (15 cents a day) has much to do with the inability of the Swatow

yard for ordinary earthwork, and rod. per cubic yard for rock. All bridges and culverts were standardized, as well as the wooden and steel scaffoldings used for erection.

The railway was five years in construction and cost:—

Land.....	£89,700
Earthwork.....	148,000



KAKCHIO, FOREIGN SETTLEMENT, SWATOW, VIEW FACING WEST—
CHINA SUGAR REFINERY ON THE POINT

sugar planter to conduct a profitable business. Prices are now so low as to leave little or no margin of profit to the grower and boiler and the export has fallen off about 50 per cent in recent years.

A short railway of standard gauge, 24½ miles in length, connects the port of Swatow with the city Ch'ao Chou Fu to the North. In 1903 a wealthy Chinese merchant obtained the concession for this line, employing a Japanese contractor to carry out the work, and Japanese employees of the Railway are in evidence at every station. Altogether there are nine stations in the 24½ miles, and the fares for the whole distance are 1st class 1 dollar 30 cents; 2nd class 80 cents; 3rd class 50 cents. Three trains run each way daily and the scheduled time between the termini is one hour 31 minutes. The line is said to have cost 3,500,000 dollars to construct, and pessimistic views are held by Europeans in regard to its condition. It is said to be running at a loss as it taps no large populous centres en route.

THE SHANTUNG RAILWAY

The Shantung Railway, completed in 1904, is about 245 miles long, running between Tsingtao and Tsinanfu, the capital of the province of Shantung, with a branch line of twenty-four miles to the Poschan coalfields, says the *Deutsche Banzeitung* of Berlin. The longitudinal section shows that the main line is made up of forty-two per cent level, twenty-nine per cent rise, and twenty-nine per cent fall, with a maximum grade of six per cent. The permanent way has been constructed to sustain ordinary traffic at a speed not exceeding 37.5 miles per hour. The article contains detailed accounts of the survey, as well as full particulars with regard to the cost of land, labour, transport and materials. The survey covered an area of a strip of land varying in breadth between 500 and 2,000 yards, and cost about £36 per mile, being completed at the rate of ten miles per month. The land was expropriated in accordance with Chinese law, 1s. 1d. being paid per square yard, with a surcharge of eight per cent for land in crop and near the townships. The earthwork was sublet in contracts of six miles in length, and was paid for at schedule prices, 1s. 4d. per cubic

Level crossings and fencings.....	2,700
Bridges and culverts.....	728,000
Permanent way.....	759,000
Signals, block-houses, etc.,.....	13,200
Stations.....	106,000
Repairing-shops, etc.....	85,000
Materials (coals, etc.).....	310,000
Administrative expenses.....	203,000
Interest on capital, etc.....	200,000
	<hr/>
	£2,644,600

or, including interest on capital, about £9,200 per mile. The gross receipts of the railway in 1905 were about £680 per mile, of which two-thirds were derived from goods-traffic. The working expenses for the same year were £265 per mile.

CEYLON TEA

At the annual meeting of the Ceylon Tea Traders' Association the following report on the crop for the year 1907 was included in the chairman's review:

"The Ceylon tea crop (182,023,732 lbs), for 1907, was the largest ever produced in the island, being nearly 10,000,000 lbs in excess of the yield for 1905, which was the previous record, and 12,000,000 lbs more than the outturn for 1906. It is satisfactory to know that the increase is the result of climatic conditions and of more careful and liberal cultivation. Speaking generally, I believe quality was well maintained during the past season and I trust the same system of careful plucking may be followed in 1908. The larger output cannot be attributed to fresh acreages coming into bearing, as the area of tea clearings planted up, during the past few years, is very limited.

"In 1906 the range of averages of weekly sales was from cents 30½ to cents 39 whereas in 1907 it was cents 36 to cents 45. During

the latter season 75 per cent of the weekly averages were above cents 40, and the averages for the year was cents 41, being the same as for 1896. In the intervening 10 years the rate never got nearer to this average than cents 38. It is interesting to note, however, that in 1895 the average was cents 47, so that, if business is good, there is the possibility of a further rise in prices this year. The advance has been chiefly in rates for teas from low and medium estates. Teas grown at high elevations have not benefited appreciably. After 10 years of waiting it was time for Low-country teas to have an innings, and the dividends being paid on last year's results by companies owning such properties show that they have reaped a fair harvest. High rates have no doubt made business from a buyer's point of view somewhat difficult but when the higher level has been established this will cease to be a disturbing element. Last year's shipments to United Kingdom were above those of 1906 by about 4,500,000 lbs. Russia took more tea from Colombo than any other country, outside of Great Britain, probably, in all, close on 28,000,000 lbs. including Greens and Dusts, &c., for brick making. The increase on 1906 is nearly 50 per cent. Australia came second with fully 24,000,000 lbs. and America third with 12,500,000 lbs, being slightly under exports to that Continent in 1906. Recent financial troubles there may account for the want of elasticity in that market, but, in view of the large sums spent in America by the Thirty Committee, better results were expected. I know it is argued that Ceylon and Indian teas go further than China's and that therefore a decrease in weight of tea used may mean an actual increase in tea drinkers."

BRITISH INDIAN RAILWAYS

The reports of Indian Railways which come to hand continue to bear witness to the prosperity of the companies during the first half of the current year, says the *Planters Gazette*. The Great Indian Peninsula's net revenue showed an increase of no less than 13.05 per cent., while the net earnings of the East Indian Railway amounted to Rs. 2,70,27,429, compared with Rs. 2,66,89,893 in the corresponding half of 1906. In the case of the Bengal-Nagpur the net receipts were Rs. 88,33,581, as against Rs. 83,42,733. The question of capital expenditure looms large in the reports of the two first named companies. The directors of the Great Indian Peninsula state that they have recently learned that Mr. Morley has set apart another £1,000,000 for the purchase of additional rolling stock, and that the company is to receive 800 wagons as its share. But, unfortunately, they add that the company's proportion of the additional capital grant of a million, which was referred to in the previous report, was no more than £90,000. The Secretary of State has, however, made a proposal to vary the company's contract of 1900 with a view of giving it power to raise, under his sanction and guarantee, whatever funds may become necessary for the development of the undertaking. The negotiations, however, are not yet completed. The East Indian Railway directors are seeking authority for the issue of debentures or debenture stock to an amount not exceeding £2,000,000 in order to meet expenditure for lines under construction, rolling stock, and improved accommodation for the constantly growing traffic. The Board of the Burma Railways also ask that the additional borrowing powers conferred upon them be extended from £1,000,000 to £2,000,000, and that the rate of interest be left to their discretion, instead of being fixed at 3 per cent. In the meantime the Secretary of State is advancing funds to the Burma Railways at 3½ per cent., and the Board are negotiating with him as to the course it may be advisable to take in case of the difficulties of raising a loan by a debenture issue continuing. It is obviously out of the question in the existing state of the money market to raise money at 3 per cent.

* THE HORNSBY CHAIN TRACK TRACTOR

The remarkable achievements of this locomotive claim the careful attention of mine-owners and others engaged in transport over difficult country. The Hornsby "Walking Engine," or "Caterpillar," as it has been styled by its military drivers at Aldershot, is the invention of Mr. David Roberts, M. I. Mech. E., managing director of Messrs. Richard Hornsby & Sons, Limited. Describing his system, the inventor says:—

"It provides an endless chain that travels round the weight-carrying wheels, forming on the inside a track on which those wheels run. The 'Chain Track' is formed on a number of feet, so linked together as to render the bottom portion of the chain a rigid arc with a radius of about 19 ft., the inside of which is used as a track for the weight-carrying wheels. The links which render the chain rigid when pressure is exerted from the outside, make it flexible on the inside, so that it bends round the two sprocket wheels at either end of the arc. The rear one of these is the driver, which, the sprockets being engaged in the links, propels the engine by pulling at the chain, the chain being held to the ground by the weight while the weight-carrying wheels pass over the inside track.

"The upper part of the chain pulled over by the driving wheel moves forward and is guided by the front sprocket wheel to form a fresh and endless track. The weight of the tractor being carried on the long curved inverted arch of the chain tracks, the pressure on the ground varies with its condition, and whilst on hard roads the pressure is less than with ordinary wheels, on soft ground the weight is so distributed that it can travel with safety, even where draught animals may not venture, on account of the pressure on the under surface of the chain tracks being less than that due to the weight of animals on the surface of their feet. For the same reasons the grip on the ground is vastly greater than it is with ordinary wheels, enabling loads to be hauled over ground which has hitherto been impassable. The chain track has a radius which is equal to a wheel of 38 ft. diameter.

"The method of turning is ingenious, and so efficient that the tractor can turn in double its own width. This is done through powerful brakes applied to the compensating gear. When it is required to turn, one of the chains is braked hard and the other allowed to travel. This easy manipulation is of great advantage for manoeuvring, and saves a great deal of time."

The machine has been successfully tried over the following conditions of ground:—

(1) SWAMPY GROUND.—In actual experiment a lorry loaded with 3 tons was hauled by five horses upon swampy ground, where it sank to the axles, the horses failing to drag it out. Again, a two-wheeled cart carrying 1½ tons was hauled by four horses upon the same ground, with a like result, the horses' legs sinking 2 ft. in the ground, due to the powerful effort they exerted. The engine was then connected, and the swamp was now easily traversed, an additional trailer loaded to 5 tons being drawn at the same time.

(2) UNEVEN GROUND.—An ordinary wheel meeting a large stone has to suddenly lift itself with the whole of the weight above it. The only effect of an obstacle such as a stone, rail, tree-trunk, or hillock in the path of the Hornsby Chain Track Tractor is to give a slight additional inclination to the chain track, which is raised and employed as a bridge for the weight to gradually surmount.

(3) DITCHES.—In crossing ditches, the Chain Track Tractor moves on until it reaches its critical point where the front overhangs the ditch, when the forward feet move gently on the farther side, and the rigid chain track forms a bridge over which the engine travels. Ditches in width and depth sufficient to bury the front steering wheels or the rear driving wheel of an ordinary

traction engine are crossed with safety and ease.

(4) DRY AND SOFT CLAY.—Owing to the extended surface of the chain track upon which the weight-carrying wheels rest, the Tractor does not sink into the ground, and by reason of its extended grip and great adhesion, considerable loads can be carried over exceedingly soft clay and deep dry sand.

(5) HILLS.—The Chain Track Tractor has quite phenomenal hill-climbing qualities. A bank of soft clay, 20 ft. high, which when measured showed an incline of 1 in 2, was mounted with ease.



LOOKING DOWN CANAL ROAD, BRITISH CONCESSION, SHAMEEN (CANTON), CHINA

(6) SNOW AND ICE.—The Tractor has hauled considerable loads up to the full power of its engine up hills of 1 in 10 covered with ice 1 inch thick, without breaking the ice and without slipping. This was done without ice-spikes, sand, gravel, or other artificial means being used to give adhesion, the Tractor simply relying upon the grip provided by the wooden surface of its feet.

Besides the Chain Track Tractor above described, the firm of Hornsby & Sons are now making their standard oil engine tractor on the model of the engine which won the British War Office prize of £1,000 in 1903. In countries where the roads are well made this is claimed to be immeasurably superior to the ordinary steam traction engine.

This oil engine was required by the terms of the War Office competition to haul a load up to 25 tons at a speed averaging three miles an hour for forty miles. Its own weight, when equipped with fuel, water, and stores for the journey, was required to be less than 13 tons.

Equipped with a double cylinder internal combustion oil engine, the Hornsby Tractor drew its load 58 miles, earning the prize of £1,000 and a bonus of £180 for the additional 18 miles. The weight of oil used was only one-seventh the weight of coal which would have been required for an ordinary traction engine, and the quantity of water used for cooling was only a few gallons instead of the 8 tons required by a steam tractor for the same load and distance.

With this engine as a model, the first Chain Track Tractor was constructed.

It has been said, and not without reason, that, possessing the double economy of fuel and water, plus extraordinary walking and climbing powers, the Hornsby Chain Track Tractor is destined to play a considerable part in the future economy of the world. It will be found hauling baggage

wagons and drawing heavy artillery into position in the next war. It will haul wheat, wool, and tobacco to the railway or the factory. It will make it possible for mining operations to be carried on at a profit far from existing roads and railways.

On the confines of the Empire the question of transport is a vital and often determining factor in development.

The exploitation of the pasture or the mineral wealth is of no use to the colonist unless he can get his wool, his crops, or his ore to the market, in good time and at a reasonable cost. Road development, by which

animal transport, however slow and expensive, is made practicable, as well as railway development, demands capital, and cannot be undertaken until there is a good prospect of earning a profit. In the meantime, the Hornsby system steps in to supply this want.

In South America there are cattle ranches within a hundred miles of the coast where difficulties of transport are such a hindrance to the development of business that the cost of transport places the stock raisers out of market. So, too, these districts rich in the copper, tin, and silver, which are untouched, because the cost first of getting the necessary mining machinery to the spot, and then of getting the metal to the market, is prohibitive.

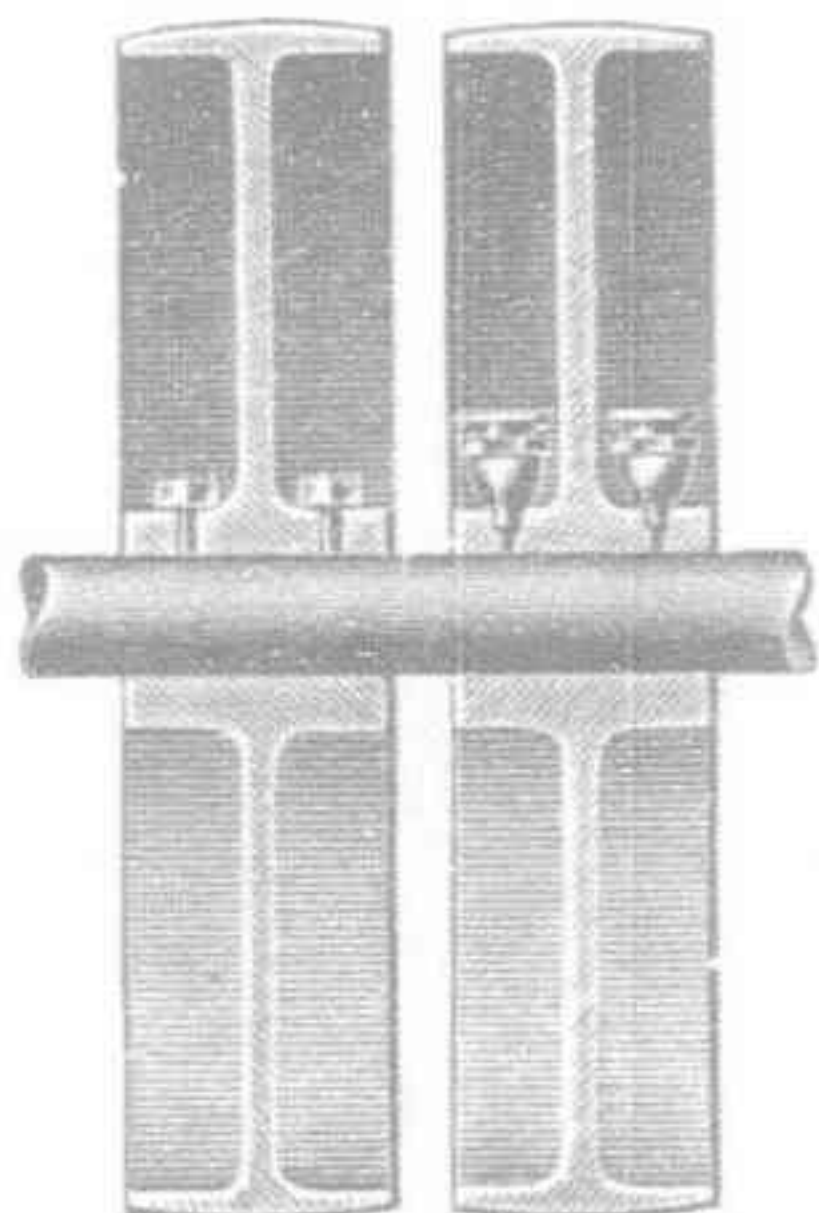
Bullock wagons with 16 or even 32 bullocks, sometimes even 4 spans of 64 bullocks, carry only a few tons, require several drivers, proceed very slowly, not more than two miles an hour, doing not more, and generally less, than 15 miles a day. Camels carry small loads of from 300 to 500 lbs. each, but they will not make more than 15 miles a day, with a rest every few days, and a short journey of 100 miles takes more than a week to accomplish.

Steam traction engines and motor lorries are available where good roads exist, but that is the limit of their efficiency. They are useless for desert, swampy, or mountainous regions. The South African War tested the power and demonstrated the narrow limits of usefulness of the steam traction engine.

Where there are no roads, traction engines fitted with ordinary wheels cannot travel, and it has been with the object of overcoming the serious limitations of the ordinary wheels, and so extending the range of usefulness of mechanical transport into regions hitherto either only partially developed, or totally undeveloped, that this new system of mechanical traction has been invented.

LUBRICATION OF LOOSE PULLEYS

It is a fact that Loose Pulleys are to the engineer a most bothersome piece of machinery, mostly due to the use of improper lubricants; generally, on account of imperfect alignment, too tight a fit or when subjected to an overload.



Bearings are liable to heat up due to the theoretically rough surfaces of two bodies, when one or both are in motion, being improperly lubricated by use of Oils which are thrown by centrifugal force from the bearing surfaces, leaving it dry; this will soon, by overheating, actually weld the parts together, called "seizing" and if the parts have seized and force is put to the relative parts, they will be strained, twisted or broken, causing a shut down.

It is apparent even to a layman that the most important condition to be met with in the care of machinery is proper lubrication and to prevent the liability of seizing and tearing apart of the relative portions of any mechanism or moving part.



This can only be successfully accomplished by the use of Albany Grease applied through a Loose Pulley cup. The special feature of this cup is the tube and the interior spindle, the latter being always in contact with the shaft, thereby conducting the least variations in its temperatures into the body of the grease cup no matter what position the cup may be in or speed of rotation the moving parts may have.

The centrifugal force is overcome, due to the Albany Grease remaining at the same consistency, except that portion adjacent to the spindle, which, liquifying, is drawn to shaft by capillary attraction or otherwise under the influence of molecular attraction, lubricating the bushing of the pulley.

When the loose pulley is at rest the grease stops its flow automatically and the bearing will be clean and free from the many objections attending the use of oiled bearings. There being no drip or spatter causing annoying and expensive damages to material and fixtures.

The danger of fire which frequently occurs with oiled bearings or the damage to belts by the oil that is intended for the bearing, when loose pulleys are driven at high speed, produce endless troubles and annoyances to the Engineer. It has further been estimated that for every drop of oil actually worn out in lubricating a bearing, at least three other drops either never reach the surfaces to be lubricated or pass through unused, requiring an excessive amount of wiping; all this is entirely obviated by the use of Albany Grease

which is a pure lubricant that has been in practical use for over 40 years and under the severest tests has been found the safest lubricant for all bearings, on account of its splendid wearing properties, having a great capacity for storing and carrying away heat, in other words, the property of keeping a bearing cool.

Albany Grease is made only by Adam Cook's Sons, 313 West Street, New York City, U. S. A.

GENERAL ELECTRIC COMPANY.

The sixteenth annual report of the General Electric Company, for the year ending January 31, 1908, shows gross profits of \$6,586,653, after deducting all patent, general and miscellaneous expenses and allowances for depreciation and losses, and writing off \$3,745,989 from factory plants. After paying \$5,183,614 in dividends, a balance of \$1,403,039 was carried to surplus account, bringing up the total surplus as of January 31, 1908, to \$16,513,836. Last year the company's profits were \$8,427,843, but the actual sales billed in the 1908 year amounted to \$70,977,168, as against \$60,071,883 in 1907.

The reports of the General Electric Company have for some time stood as an example of the way an industrial company ought to handle its finances and tell the public about them. The picture of the business year is made perfectly plain, and there are no frills in the asset and inventory values. The company has naturally had to make very heavy expenditures in the purchase of patents and will presumably have to continue doing so for many years to come in order to keep abreast with the best electrical science of the day. The value of its patents, franchises and good will account stood on the books of the company at \$8,000,000 on January 31, 1897. On January 31, 1907, this account had been reduced to \$1 by progressive writings off, charged to the current operating surpluses. During the 1908 fiscal year the company spent \$872,346 in acquiring other patents, licenses under patents and in patent litigation, and promptly charged it off to profit and loss, so that the company's patents, franchises and good will still stand on the books at \$1. This is an admirable record, and the manner in which the book values of the factory plants have been written off, year by year, is no less admirable. Starting in 1897 with plants at Schenectady, Lynn and Harrison, valued on the company's books at \$3,958,528, the company during the subsequent 15 years to date has spent \$30,892,486 on expenditures and betterments to its plants, making a total of \$34,851,014, from which 22 millions have been written off for depreciation and replacement, leaving the book value of the plants, on January 31 of the current year, at \$12,900,000, entirely free from mortgage or other lien; an average valuation of but \$2 per square foot of floor space, including land, buildings, power houses, machinery, tools and all other equipment.

The company on January 31, 1908, had no floating debt at all and had only \$1,759,517 in accounts payable as against \$29,857,727 of notes and accounts receivable. It reported \$12,250,721 of cash, as against \$3,910,709 in January, 1907, the difference being in considerable part accounted for by the funds derived during the year by the issue of \$12,872,750 of 5 per cent 10-year convertible debentures and by the sale of \$1,594,600 of new capital stock. Thus the company's cash position is excellent, as it is highly important that it should be. Collections of its very large accounts receivable will presumably be slow in dull times, although the company actually collected some \$66,000,000 from notes and accounts receivable during the year, as against \$53,000,000 collected in the 1907 fiscal year. All but \$3,544,586 of the \$27,094,348, representing the face amount of notes and accounts receivable on January 31, 1907, was collected during the year.

Among the important orders received during the year were: One hundred and sixty-five-mile transmission for Great Western Power Company, California; Detroit tunnel electri-

fication; Cascade tunnel electrification; Great Northern Railway; electrification of Southern Pacific suburban lines in California; electrification of Hudson tunnels; additional equipment for West Jersey & Sea Shore, and for New York City terminal of the New York Central.

The following table shows the company's sales and orders for the last six years:

Sales		Orders	
billed.	received	billed.	received
1908...	\$70,977,168	\$59,801,040	1905... \$39,231,328
1907...	60,071,883	63,483,659	1904... 41,699,617
1906...	43,146,902	50,041,272	1903... 36,685,598
			1902... 39,914,454

PEKING AND KALGAN RAILWAY TUNNEL

The piercing of the tunnel in the section of the Kalgan or Chingchang Railway between Nankau Pass on the Southern end, and Kalgan, called Chang-chia-kao, is now accomplished, says the *P. & T. Times*.

This tunnel is 3,570 feet long, and its construction has taken the Chinese unceasingly for about a year and a half to complete.

The building has been carried out by Chinese contractors, who worked from the Southern as well as from the Northern end of the tunnel. In addition the work was also carried on through a shaft which was sunk several hundred feet from the highest point of the mountain pass, just where the inner section of the great Chinese Wall runs.

It is at the highest point of the Pass that the large tunnel is pierced and from it another 60 miles of road lead down towards Kalgan.

When this road, in about a year, is finished, it is expected that the bulk of the merchandise, which since time immemorial is carried over this Pass from China into Mongolia and Siberia, or vice versa, will be transported by rail. At present the stream of transport goes on camelback, on donkeys, mules, horses and carts, and it is a most interesting sight to watch the continuous lines of animals loaded with merchandise and raw products, passing along this historic route.

Credit for the building of the line is due to Director General Jeme, a graduate of Yale, and an A. M. I. C. E.

The main section of the tunnel works is in charge of Engineer Yente-ching, who was in the employ of the former American syndicate to build the Yue-han Railway. The Peking-Kalgan line will cover 130 miles. There is very little elevation from Fengtai to the Nankau Pass, but after entering the Pass the elevation rises 1,800 feet in the short distance of 10½ miles.

The rails are laid on narrow high embankments for the greater part of the whole road.

The recent rumor of a tunnel disaster at this section is entirely unfounded.

THE HART-PARR MOTOR

The introduction of the Hart-Parr motor, which operates by the use of petroleum, gasoline or alcohol, in the development of agriculture in the Philippines, promises to meet with exceptional success. Mr. C. E. Helvie, the sole agent of the manufacturers in the East, superintended a successful exposition of the capacity of the motor at Pasay, Manila, last month, in the presence of insular officials and leading hacenderos. The motor used weighed 9 tons with a nominal capacity of 22 h. p. and a brake force of 40 h. p. The trial was confined to plowing with two gangs of plows or twelve plows in all. This equipment turned furrows to a width of 10 feet and a depth of 8 inches and showed a capacity of plowing 25 acres in ten hours.

The labor required in all includes an unlicensed engineer and a helper as the motor is simplicity itself and specially built to eliminate the necessity of any degree of technical training for its successful operation.

The result of the trial was a pleasing surprise and the demand for the machine is daily increasing.

IRRIGATION PROBLEMS

The Philippine Government has appropriated ₱750,000 for the purpose of installing irrigation systems in the archipelago which, with ₱250,000 made available last year, gives ₱1,000,000 for this work which will be promptly prosecuted. This action was taken in view of the danger from drought which last year had a serious effect on the rice crop. This action of the Philippine Government has been the result of special study of the success with which the British have installed irrigation systems in the Far East and with the advantage that the Philippine Government will have the benefit of British experience. With rich soil, an agreeable climate and a reliable supply of water for irrigation, the farmer is in the position of one who may expect with the greatest degree of confidence that Providence will do the rest. The farmer who depends on the irregular rainfall is one who has failed to appreciate the old saw, "Providence helps those who help themselves." This has been the result of constant effort on the part of the Hon. W. Cameron Forbes, Secretary of Commerce and Police.

Experience has taught some bitter lessons, but it cannot be said that the government of India has not profited thereby. There has already been inaugurated a gigantic system that might be said to be the mere nucleus of the complete scheme proposed in that colony.

Irrigation in Australia has been discussed for years and there is prospect that in the successful exploitation of the idea, an era of the greatest development the world has ever known will be inaugurated. In this connection, *Capital*, the leading financial paper of India, under the caption "Colonial Irrigation," says:

"Where irrigation plays such a prominent part as is the case in India, it is of interest to learn what is being done in this direction in other portions of the Empire. It was thought, a few years ago, by pastoralists, and others in the Australian Colonies, that though artificial watering of the soil might be profitable in a country like India, where labour is cheap and abundant, it would be waste of time and money to attempt it in Australasia, with its sparse population and expensive labour. This notion has been totally dispelled by the experiences of the past few years, and irrigation on a considerable scale is taking place in all the Australian States by means of artesian wells, and water is found in large areas over many hundred thousand square miles in Queensland, New South Wales, South Australia and Western Australia. The supply comes both from the rainfall itself, and from the various rivers which soak through their channel beds into a soft absorbent rock which is tapped by boring to varying depths, even as great as close upon 3,000 feet. The results are in some cases truly marvellous, one Government bore in New South Wales, giving out over 800,000 gallons of excellent water per day. Curiously, Victoria is the only one of the Colonies where this artesian water appears to be in small supply, it being thought that there is a wall of impervious rock on the border of New South Wales, which diverts the underground current. From some of these bores the pressure is immense, and the water is thrown to a great height, whereas in others it only just overflows the bore hole, the difference, no doubt, of course, depending upon the relative elevations of the place of intake and that of outflow.

"Irrigation, therefore, may now be regarded as having passed the experimental stage and, whilst there is argument for the saving of the necessary plant required, and growing crops by the more natural means which, generally speaking, are fairly successful in every two out of three years, it is of much interest to compare the net result on non-irrigated land of similar character and under similar climatic conditions, on the experience of one of the pioneer irrigators.

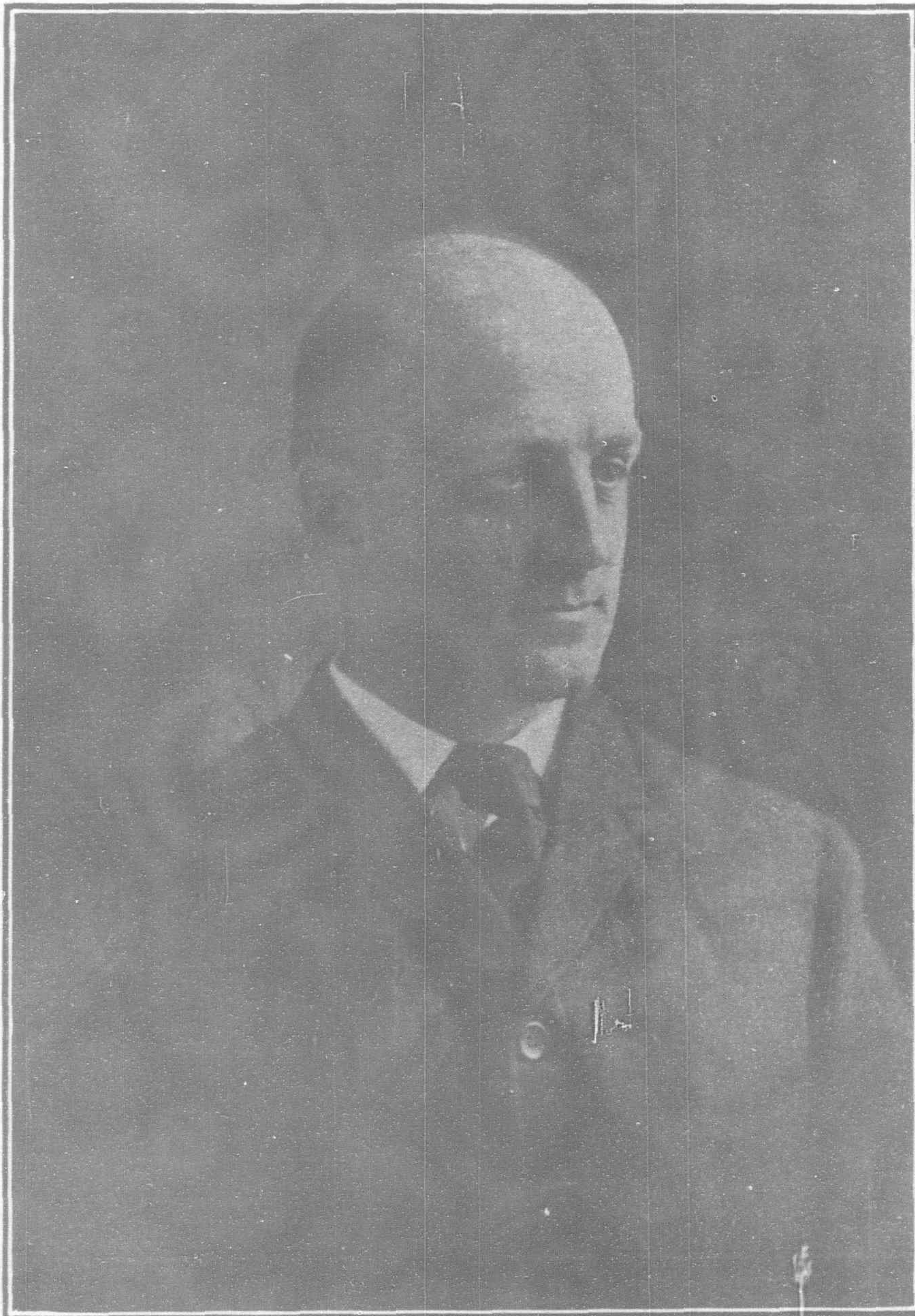
"The yield per acre on the unirrigated land was as follows:—

Wheat 10½ bushels:	on the irrigated	20 to 45 bushels
Hay 1 ton 2 cwt.	" " "	2 " 4 tons
Barley 10 bushels	" " "	30 " 52 bushels
Potatoes 2 tons	" " "	9 tons

"On the Government experimental farms, as well as on private properties, all sorts of fruit, grain, lucerne, root crops, and products of every kind, have been grown with success. Hay yields enormously as above shown, sorghum grows to a height of 8 feet in 10 weeks, and fruit grows to perfection. In one district experience showed that 15,000

to 12 shillings per acre for a full supply of 24 to 30 acre inches.

"The furrow system is that most generally adopted, where practicable, being economical and causing less evaporation, as well as having the advantage of an equal distribution over and soaking of the soil, and being available for cultivation as soon as the furrows become dry. After cultivation, land which has been irrigated, retains the moisture, as the loose soil on the top prevents much of the eva-



THE HONORABLE W. CAMERON FORBES, SECRETARY OF COMMERCE AND POLICE, PHILIPPINE ISLANDS, THE FATHER OF IRRIGATION IN THE PHILIPPINE ISLANDS, WHO SAILS FOR THE HOMELAND ON A VACATION THIS MONTH

sheep can be fed upon 250 acres of irrigated land for three months.

"The Government has also various schemes on hand for the conservation of water, one being a high masonry dam across the Murrumbidgee River, designed to hold a depth of 200 feet of water and having a capacity of 766,000 acre feet of water.

"Another scheme is a moveable diversion weir, on the same river, to turn the water from the river into a main canal; with various distributing channels to convey the water on to numerous small holdings. The irrigation rate proposed for land on this canal works out to the moderate annual rate of 10 shillings

poration, and therefore crops so watered and worked will require less frequent waterings than where cultivation is not carried out.

"It has often been discussed as to whether, if irrigation were to proceed on a very extensive scale in the Australian Colonies, there would be a sufficiency and constant supply of water, and as far as is at present known, it may be answered affirmatively, the supply apparently being inexhaustible.

"Up to now the results have been eminently satisfactory, and the tendency is for the irrigable portions of the various states of the Commonwealth to steadily attract population."

* THE STRENGTH OF CULVERT PIPE

There is little published information regarding the stresses to which culvert pipes in railroad embankments are subjected by the conditions of bedding and earth pressure. The ordinary cast iron water pipe, generally used for this purpose, is designed merely to withstand the internal hydrostatic pressures encountered in service, since in most cases this gives pipes of the desired rigidity. The external stresses have heretofore been regarded as indeterminate, authorities agreeing that there seemed no satisfactory way of computing them. For that reason the tests which have been made at the University of Illinois on both cast iron and reinforced concrete culvert pipe are of special interest and value in throwing light on this subject.

The experiences of different roads with cast iron culvert pipe do not seem to be uniform, some claiming to have little or no trouble, while others have a great many breakages. We have heard of one road which made it a rule not to use cast iron pipe in banks under 10 ft. or over 25 ft. high. But the real conditions to be observed are careful bedding and tamping to assure as even a distribution as possible of the bearing pressures. This may be further helped by shoring up the bearing pressures. This may be further helped by shoring up the barrels of the sections to equalize the support, and some roads do this.

Proper trenching is presupposed. Engineers have reported pipes breaking without apparent adequate cause. With the ordinary rectangular-bottom trench it is harder to equalize the pressures than where the bottom is curved and the material is well tamped around and under the pipe. Tamping is very necessary, otherwise, the earth immediately under the bottom element is unduly compressed and concentrated loading results. There is a record of some 48-in. cast iron pipe $1\frac{1}{4}$ in. thick being flattened $\frac{1}{4}$ in. under an 8-ft. fill, and more than $\frac{7}{10}$ in. under a 22-ft. fill. Pipe of these dimensions distorts slightly from its own weight, careful measurements of lengths lying on the ground, and therefore having one line of support, showing a difference between the vertical and horizontal diameters of over $\frac{1}{10}$ in. With an increase of the thickness to $1\frac{1}{2}$ in. this distortion was not noticeable.

The results of the University of Illinois' tests were presented in condensed form by Professor Talbot, of that university, in a paper presented at the April 15 meeting of the Western Society of Engineers. In addition to the main tests, the investigation included a lot of auxiliary tests to give data on the action of pipes in other methods of testing. In discussing the mechanics of pipes and rings subject to external pressure, formulas were developed for the bending moments under certain assumed conditions of loading. These are intended only to serve as a basis for calculations, since the assumed conditions do not represent accurately the conditions of bedding and loading found in practice. The nature and extent of the possible or probable variations from the assumed conditions were discussed, however, and the effects of such divergence considered. In the main tests a special testing apparatus was used. It included a box of stiff construction, the pipes being embedded in sand in this box and the load applied through a saddle resting on the sand cushion. Nine cast iron and five reinforced concrete culvert pipes were tested. Both light and medium weights in the cast iron pipes were used. Four were of 36 in. diameter, two being 1 in. and two $1\frac{1}{4}$ in. thick. Five were of 48 in. diameter, three being $1\frac{1}{4}$ in. and two $1\frac{1}{2}$ in. thick. In the order given, the average breaking loads were, in pounds per lineal foot, 24,750 lbs., 37,250 lbs., 28,800 lbs. and 51,950 lbs.

The reinforced concrete culvert pipes were the designs of the Chicago, Burlington & Quincy Railroad, described in the *Railroad Gazette*, October 12, 1906, but improved in

a number of respects since that time. All of the pipes were 3 in. thick, the difference being in the method of reinforcing. The load at first crack, in pounds per lineal foot, varied from 4,950 to 10,960 lbs. The maximum load varied from 23,800 to 31,500 lbs. The data does not indicate the method of reinforcing corresponding with these figures. It should be mentioned regarding these pipes that two of them were frankly experimental, and in one, for some reason unknown, the concrete proved poor. Only two of the five, therefore, were representative. We assume that it was these two that showed the highest loads.

One notable difference between the reinforced concrete and cast iron pipe is that while the latter collapse completely under a maximum dead load, the action of the reinforced concrete pipe is quite different. Final failure is through crushing of the concrete, and after passing the critical load there is a large margin of strength available in an emergency. Reinforced concrete pipe can be made as strong as cast iron pipe simply by increasing the thickness of the concrete, the gain being proportional to the square of the diameter. The object with this pipe, however, should be simply to make it strong enough to stand the service when carefully and properly laid and thus save as much as possible over the cast iron pipe. Another consideration is the possible saving in transportation costs, which are sometimes excessive on new work. We have heard of one case recently where 60 cents per ton mile was paid for testing cast iron culvert pipe for a new line which was being built through very rugged country. Reinforced concrete pipe can be made at or near the site, saving this considerable additional expense.

PHILIPPINE RAILWAY CONSTRUCTION.

The unusual May typhoon, accompanied by heavy rain, interfered materially with the progress of construction on the island of Luzon but the fine weather following has made it possible to proceed and it is expected that before the rainy season, proper satisfactory results will be obtained.

On May 24th, the line connecting Paco with Cavite began operations as far as San Roque. This line which is operated by the Manila Railway Co. is about 30 kilometers in length. Traffic on the Camp One branch from San Fabian was suspended with the close of the season at Baguio.

The entire line connecting San Fernando de Pampanga with Florida Blanca via Guagua and Lubao has been operating since April 10. This branch is 24.5 kilometers in length.

Work on the Calamba-Santa Cruz line is being pushed. This branch when completed will tap the Manila-Batangas line.

The Philippine Railway Company's construction is well under way in Cebu where the entire line has been in operation for some time connecting Danao and Argao. With the exception of bridge work it might be said that the entire line is complete.

In Panay grading has been completed as far as the 30 mile post and the ballast and steel is down within half a mile of that point. With the completion of the steel bridge across the river Ulian the construction work will proceed with greater expediency, if the rainy season does not interfere with the work. The bridge material has been coming in regularly and there is prospect of little delay for want of material. The construction of shops, stations, buildings, etc., is progressing apace, and the character of the work, with a view to permanency, is of the very best. Concrete is the chief material used.

The rolling stock in the knockdown has been arriving and workmen are busy assembling it.

The preliminary survey of the line in Negros has been completed and the Philippine Railway Company has asked for the approval of the route connecting Saravia and Himamalan and of the extension of this line to Cabancalan on the River San Juan de

Ilog, with the abandonment of the northern branch connecting Saravia and Escolante. It is believed the routes proposed will meet with the approval of the government.

CONVERSION OF COAL INTO GAS

"THE proposals made from time to time to cheapen the cost of fuel by converting the coal into gas at the pit-mouth, as has been done by the Mond Company, or by its use for the generation of electricity at the colliery and the transmission of the energy to any required distance for heating and lighting, as has been suggested by Sir Oliver Lodge as a possible remedy for fogs, no doubt have many advantages, but we, says the *Times Engineering Supplement*, have still to learn whether these plans are commercially practicable. It is interesting to observe that a trial of the latter system of using the coal is now being carried out upon a large scale at a French colliery. The Société des Houillères de Ronchamp is putting down a generating station of 30,000 h. p., to supply current for lighting and power purposes over a wide area in the industrial districts of Doubs and the Vosges and the country round Belfort. This installation will be on a sufficiently large scale to test the comparative cost of energy transmitted in the form of electric current, as contrasted with that conveyed in the form of coal, and, no doubt, the results of the operation will be studied with interest by all users of power, both here and on the Continent. There is already, in the Durham and Northumberland coalfields, a company operating on somewhat similar lines, which, with the command of coal at the colliery itself, is enabled to earn a handsome profit for its shareholders."

NEW GOLD SAVING APPARATUS

A new gold saving shake sluicing machine with a capacity of 16 tons a day and employing the labor of only two men has been invented by an Australian and successfully tested by treating the tailings in the Dee River which had been abandoned by the Mount Morgan Co., says Consul General Bray of Melbourne. It is claimed that sands containing but one-half pennyweight a ton can be worked to advantage. It is also said to be as successful in the treatment of tin ore of the lowest grade. The amount of water required averages about the same as the ordinary sluices and cradles. A company has been organized to manufacture the machine and introduce it in other countries.

SERENDAH BAHRU MINE

The formal opening of the plant of the Serendah Bahru took place the latter part of February when Mr. Nightingale, inspector of mines, by direction of Mr. Tully, the owner, turned on the water from the hydraulic monitor giving a stream of 75 pound pressure, says the *Malay Mail*.

The steel piping throughout the mine is about 11,000 feet in length and conveys the water to the five monitors from the reservoir on a hill adjoining the property. This piping consists of 14", 10", 8" and 6" service pipes. On the hill an intake dam measuring 5'x6.5'x4' has been constructed and the piping through this receives a continuous supply from a river source.

YLANG YLANG CULTIVATION

Writing from Singapore, Consul-General Thornwell Haynes states that in the province of Bienhoa, Cochin-China, it is reported that the cultivation of the ylang ylang tree, which is so famous for its yield of perfumery essences, has been taken in hand on several estates with satisfactory results. The high price given for ylang ylang essence makes the cultivation of the tree highly remunerative. It is stated officially that two acres planted with 300 trees may give 6,500 pounds of flowers which at the least may yield 33 pounds of essence. At \$18 per pound this would mean nearly \$600.

* *The Railroad Gazette*.

FAR EASTERN COMPANY REPORTS

WATKINS, LIMITED.—The result of the year ended December 31st, 1907, shows a profit of \$13,282.32 of which there was allotted to meet interest on mortgage and loans \$2,539.15; depreciation \$3,972.54; reserve for doubtful debts, \$1,726.96; building depreciation reserve \$2,000, and loss on subsidiary coins and exchange \$2,963.55, leaving a balance of \$754.58 to carry forward to next account.

NATIONAL BANK OF CHINA.—At the meeting of the shareholders at Hongkong, May 16th, the accounts showed that the balance of \$71,293.09 brought forward from last year together with \$150,000 from general reserve fund were required in addition to the working profit during the year to make full provision for bad and doubtful debts in 1907, and previous years, as foreshadowed in the chairman's speech at the annual general meeting held in 1906. This left \$150,000 in the general reserve fund and a balance of \$10,223.09 to be carried forward to next account.

NETHERLANDS-INDIA DISCOUNT BANK.—At the 50th annual meeting of this institution held at Batavia on June 3rd, the sum of Florins 731,538.29 was carried forward after paying a dividend of 8% which amounted to Florins 480,000.

YANGTSE INSURANCE ASSOCIATION, LIMITED.—At the meeting held April 28 the payment was authorized of dividends to holders of the 8000 Old Shares in the Association of 25% viz:—\$12 per share (=20%) out of the balance at credit of 1906 account and a special dividend of \$3 per share (=5%) out of interest earned for 1907.

LEDBURY RUBBER CO., LIMITED.—The net profit of this company for the year ended February 29th was \$2,941.87 which added to balance of \$353.46 brought forward from last account was carried forward to next account.

THE BLACKWATER (KLANG) RUBBER CO.—The report of this company for the year showed a net profit for the year of Rs. 38,353.30 and with the Rs. 557.53 brought forward, made Rs. 38,910.83 available out of which a final dividend of 8%, making 15% for the year, was directed paid and the balance of Rs. 9,173.73 carried forward.

ANGLO-MALAY RUBBER CO., LIMITED.—This company recently declared a final dividend of 10% making 20% for the year and carried forward £3,350.

SANDYCROFT RUBBER CO., LIMITED.—At the annual meeting of this company held at Singapore, a dividend of 15% was authorized.

THE TIENTSIN BAUGESELLSCHAFT.—The net profit for the year amounted to Tls. 24,371.16 of which the following disposition was made: written off buildings, electric light plant, club building and furniture, Tls. 9,312.62; to the reserve fund, Tls. 750; 7% dividend on 1,610 shares for one year, Tls. 11,270; 7% dividend on 190 shares for three-quarters of a year, Tls. 997.50; 7% dividend on 18 shares for three-quarters of year, Tls. 63.00; remuneration to directors, 200. 5% dividend on 1610 shares for one year, Tls. 805.00. 5% on 900 shares for one-quarter year, Tls. 71.25 and 5% on 18 shares for one-half year Tls. 4.50; balance carried forward, Tls. 897.

LLEWELLYN & CO. LIMITED.—At the annual meeting held May 15th, this company authorized the payment of a dividend of 10% or of \$6 a share for the year.

THE STAR FERRY CO., LIMITED.—The amount to the credit of profit and loss for the year ended April 30th, after paying for repairs and placing \$7,785 to the credit of

Insurance Fund was, \$24,898.52 which was disposed of as follows:

Directors' and auditor's fees \$1,100.00, dividend of 10 per cent. \$15,000.00, write off boats \$87,000.00, and carry forward to new account \$98.52.

PEAK TRAMWAYS CO., LIMITED.—At the meeting of this company held on May 16th, the directors' report was adopted and the following disposition made of the total balance to the credit of profit and loss of \$42,785.70 which included \$2,655.63 brought forward: Remuneration for directors, \$2,500.; remuneration for general managers of 5% on the gross earnings, \$4814.05; an 8% dividend absorbing \$23,000.00; \$5,000 placed in the Reserve Fund and a balance of \$7,471.65 carried forward.

CEYLON RUBBER ESTATES, LIMITED.—This company has authorized the payment of 2.5% final dividend, making 5% for the year.

JEBONG (PERAK) RUBBER CO.—The report for the year submitted at the annual meeting held at Colombo in April showed a falling off in profit compared with the previous year's record and a final dividend of 4%, making 7% for the year was authorized.

HODEN OIL COMPANY.—The report for the half-year ended March 31st, shows net earnings amounting to 1,367,668 yen, which was disposed of by writing off 242,668 and paying a dividend of 36% per annum.

HALL & HOLTZ, LIMITED.—The report for the year showed a profit of \$15,002.65, which together with the amount forward from former account made \$50,159.85 available and which was disposed of at the annual meeting held April 30th by the payment of a dividend of 10%, the balance being carried forward.

THE COLOMBO ELECTRIC TRAMWAY CO., LIMITED.—As a result of the year's workings, a dividend of 4% was paid, £5,111 placed in the reserve and £935 carried forward.

INDO-CHINA MANUFACTURING CO., LIMITED.—This company for the year ended December 31st, 1907, made a profit of Rs. 1,63,305 out of which an interim dividend of Rs. 50 and a final of Rs. 75 were paid.

INDIAN MANUFACTURING CO., LIMITED.—This company paid an interim dividend of Rs. 30 last October and a final dividend of Rs. 20 a share.

NORTH GERMAN LLOYD.—This company has declared a dividend of 6.5%.

NANKAI RAILWAY COMPANY.—This company has declared a dividend of 10% per annum for the term.

THE CHUGOKU RAILWAY CO.—A dividend of 4.3% per annum has been paid by this company for the half year.

THE HANSHIN ELECTRIC RAILWAY.—A dividend of 5% per annum has been authorized this company for the term.

MONOMO-ARIMA ELECTRIC RAILWAY CO.—This company has declared a dividend of 5% per annum for last term.

UJIGAWA RAILWAY CO.—The shareholders of this organization have authorized a dividend of 5% per annum for the term just ended.

KYOTO ELECTRIC RAILWAY CO.—An 8% per annum dividend has been declared by this company for the last half year.

BISAI RAILWAY CO.—A five per centum per annum dividend has been declared by this organization for the term.

OSAKI DENKI BUNDO.—This company has authorized a dividend of 8% per annum for the term just ended.

NAGOYA SUGAR REFINING COMPANY.—The net profit from the working of this company amounted to 9,394 yen for the term and no dividend was declared.

HODEN OIL CO.—At the general meeting of this company a dividend of 6% was declared for the term just ended.

OSAKA JUNK KAISEN KAISHA.—At the general meeting held recently a dividend of 30% per annum was declared.

CALCUTTA TRAMWAYS COMPANY, LIMITED.—A final dividend was directed paid amounting to 2s. 6d. a share and making in all 6% for the year ending December 31st, 1907.

HONGKONG ELECTRIC CO., LIMITED.—The balance to the credit of profit and loss for the year ending February 29th, 1908, was \$159,637.13 and the following disposition was made of the amount at the annual meeting held May 16th.

After deducting \$3,000.00 for directors' fees a sum of \$156,637.13 was dealt with as follows:—To pay a dividend of 10 per cent:—say \$1.00 per share on 60,000 shares \$60,000; to pay a bonus of 2 per cent., say 20 cents per share on 60,000 shares \$12,000; to write off plant account for depreciation \$58,308.60, to write off from land and building account \$13,612.10; to pay a bonus to staff \$3,395; to carry forward to next account \$9,321.43=\$156,637.13.

IMPERIAL CEYLON TEA CO.—This company declared a dividend of 5% for 1907 against 3% for the previous year.

KUANTAN TIN MINING CO., LIMITED.—With the balance brought forward from the previous year the balance to the credit of profit and loss at the end of the year was \$42,569.83 out of which an interim dividend of 25% was paid, and at the annual meeting a final dividend of 10% was authorized, making 35% for the year.

ANGLO-MALAY RUBBER CO., LIMITED.—This company has declared an interim dividend, making 20% for the year 1907.

SHELFORD RUBBER ESTATE, LIMITED.—The profit for the year amounted to £377. No dividend was declared.

BEVERLAC (SELANGOR) RUBBER CO.—The net profit for the year was Rs. 50,737.56 and, with amount forward from former account, made Rs. 52,016 available and a dividend of 10% was authorized paid at the annual meeting absorbing Rs. 50,000, the balance being carried forward.

ALLIANCE TEA COMPANY, CEYLON.—This company paid a dividend of 8% and carried £2,500 to the reserve for 1907 against 7% for the previous year.

THE HIGHLAND TEA CO. (CEYLON).—This company paid a final dividend of 5%, making 7.5 for the year 1907, against 6% the previous year.

CHINA IMPORT & EXPORT LUMBER CO., LIMITED.—At the annual meeting of this company a dividend of 10% was declared for the year ended December 31st, 1907.

NARITA RAILWAY CO.—At the regular general meeting of the shareholders of this company a dividend was declared of 5.5 per cent per annum.

ASTOR HOTEL CO., LIMITED.—At the annual meeting of the shareholders of this company, a dividend of 5% was declared for the year.

HIGHLAND AND LOWLAND PARA RUBBER CO., LIMITED.—This company paid a final dividend of 7.5% making 12.5% for the year.

THE SHANTUNG (GERMAN) RAILWAY.—The announcement has been made from Berlin that this company has paid a dividend of 4%.

A. S. WATSON & CO., LIMITED.—The total balance to the credit of profit and loss, including the amount brought forward from previous year, amounted to \$87,014.79 according to the report of this company for the year ended December 31st, and this amount was disposed of as follows:

General Managers' Commission of 5 per cent. on the net profits for the year \$4,076.60; Remuneration of the Consulting Committee, \$2,500.00; an Interim Dividend of 3 per cent. in November last absorbing \$27,000; Dividend of 3 per cent. (making 6 per cent. for the year) which will absorb \$27,000; to write off Building Improvements, Furniture, Fittings, Utensils of Trade, Aerated Water Plant, and Machinery, \$20,000; to carry forward to 1908 Account, \$6,438 19.

CONTRACTS AWARDED

The Hongkong Whampoa Dock Co. has secured the contract for the construction of two more vessels for the Canton Water Police Service to cost \$64,000 each. The dimensions are 120 feet long and 18 feet wide. They are to have a speed of 14 knots.

Messrs. William H. Anderson & Co. of Manila secured the contract for supplying the Philippine Government with 36,000 barrels of cement. This firm handles the Green Island Cement and the price at which delivery is made is P4.75. The other bids were Messrs. Peabody & Co., Atlas cement, P5.00; Messrs. Findlay & Co., Alsen cement, P5.15 and P5.45; and Messrs. Macondray & Co., Pyramid Cement, P5.19.

Bids were opened by the Naval Department for the supply of 2,000,000 pounds of fresh beef and 60,000 pounds of fresh mutton at Manila, June 5th. The two bids were those of Messrs. Castle Bros.-Wolf & Sons who quoted .195 centavos a pound for beef and .1675 a pound for mutton; and the Philippines Cold Storage .1998 centavos a pound for beef and .1690 centavos a pound for mutton.

Bids for the construction of a coal scow of light draft, to be used at Batan Island, were opened last month by the Chief Quartermaster of the Division. Following are the bidders, with amount: Varadero de Manila P9,000; Cho Chung Lung P8,650, and Wong Tid P7,500. The estimates have been taken under advisement and award will be made later.

Bids submitted for the erection of six pumping stations for the new sewer system of the city of Manila were opened by the Municipal Board on June 5th. The bidders were: The Atlantic, Gulf & Pacific Co., Robert M. Loper, J. E. Ainsworth and Harry Thurber, the lowest tender being P145,914 and submitted by the Atlantic, Gulf & Pacific Co.

FAR EASTERN MINING OUTPUTS

TIN

April returns from the different mines are as follows:

Belat	Piculs	514
Bruseh	"	402
Gopeng	"	620
Kanaboi	"	186
Kinta	"	440
Kledang	"	275
Kuantan	"	255
Lahat	"	320
New Gopeng	"	247
Pusing Lama	"	420
Rambutan	"	146
Redhills	"	330
Royal Johore	"	150
Sempan	"	100
Serendah	"	619
Sipiau	"	120
Tronoh	"	2,190
Société des Etains de Kinta	"	2,740
North Tronoh	"	271
Mendrus	"	171

GOLD OUTPUT

Raub Australian Gold Mining Co., April, 1,065 Oz.
Oriental Consolidated for March, Gross Receipts, \$120,898 gold.
Philippine Gold Output.
Benguet Consolidated for May 202 Oz. and 30 Lbs cyanide at \$30 a Lb.
Paracale Dredging Co. for May, 221 Oz.

PERSONAL

Mr. J. Howell May, of the Customs Service, has been promoted to the position of Outdoor Deputy Commissioner at Canton and also received the Order of Double Dragon of the Third Class.

Mr. J. W. Denny, the well-known mining engineer, is now connected with the native mines at Wuhu.

M. Klobukowski, the well-known French diplomat, will succeed M. Beau as governor-general of Indo-China.

Mr. H. E. Fulford, C.M.G., H.B.M.'s consul-general at Mukden, is in London.

Mr. A. E. Lewis, General Manager of the Sempan Tin Mines and the Malay and Siam Corporation, has severed his connection with these companies.

Mr. E. J. Valentine has been appointed inspector of mines, Negri Sembilan.

Sir William Taylor, the resident-general, left Kuala Lumpur for the homeland last month.

Mr. H. C. Belfield, British Resident of Selangor, will undertake the Resident-General's duties during his absence.

Sir Henry Spencer Berkeley, Knight, K. C., has been provisionally appointed an unofficial member of the Executive and Legislative Councils of Hongkong during the absence of Mr. Henry Keswick. Mr. Henry A. Ware Slade has also received a similar appointment to act during the absence of Mr. Edward Osborne.

Mr. T. G. H. Brayfield has been appointed second assistant marine surveyor of the port of Hongkong to succeed Mr. H. L. Fletcher, resigned.

Mr. T. Neave, Acting Superintendent Engineer of the Kowloon Docks, is enjoying a vacation to the Homeland. He will be absent for about six months.

Mr. A. H. Ough, architect of the firm of Messrs. Leigh & Orange, sailed from Hongkong last month for a visit to England via Siberia.

Mr. W. T. R. Preston, commercial agent for Canada in the Far East, sailed last month for Yokohama after a short visit to Hongkong.

Mr. G. Stothard, manager of the Malakoff Estate, province of Wellesley, and William Duncan, manager of the Nova Scotia and Rubana States, Perak, sailed last month for London.

Mr. F. Kilian, foreign manager of the Siam Commercial Bank, sailed for home early in May.

Mr. Wilbur T. Gracey, American consul at Tsingtau, is on a vacation in the United States.

Mr. Wilson, manager of the Kowloon Docks, returned from an extended trip to Europe, last month.

Dr. Tenney has been appointed Chinese secretary of the American legation at Peking to succeed Mr. E. T. Williams promoted consul-general at Tientsin.

Mr. Skinner Turner, British judge in Siam, has been transferred to Shanghai.

Dr. Wendschuh has been promoted from Manila to be German consul-general at Seoul, Korea.

Mr. A. E. Dencker, the well-known mining engineer, was recently appointed metallurgical engineer to the Oriental Consolidated Mining Co. of Korea.

Mr. C. G. Warnford Lock has assumed the management of the Sempan Mines, Limited. Mr. N. Dalrymple is the resident director.

Mr. A. A. Bristow, formerly manager of the Ipoh Marble Works, has accepted the position of chief engineer of the Lahat Mines, Limited.

Mr. Georges Bain of Kuala Lumpur has been chosen as European representative of the Eastern Smelting Co. and will leave for London at an early date.

Mr. M. Wilde, of the firm of Messrs. Stang, Wilde & Co. of Tientsin, is to take a six weeks' vacation which he will spend in Europe.

Towky Foo Choo Choon, the most prominent Chinese mine owner in the Straits Settlements and the Federated Malay States and who recently secured a mining concession from the Chinese government in the island of Hainan, has been elevated to the mandarin rank of the third rank by the Chinese Emperor, and Mr. Go Choo Chye, another prominent Chinaman, has been elevated to the mandarin rank of the fourth rank.

Dr. Wooley, formerly of the bureau of science at Manila, and until recently director of the Royal Laboratory of Siam, has been promoted to Director of the Royal Department of Public Health for Siam. Dr. Ralf T. Edwards, also of Manila, takes charge of the laboratory.

OBITUARY

The report has been received from Davao of the murder by two treacherous Manobos of Henry M. Ickis, mining engineer and topographer of the Division of Mines, Philippine Bureau of Science, on April 1st, while Mr. Ickis was making a reconnaissance through Northern Mindanao. The unfortunate engineer was a native of Creston, Iowa, and a graduate of the Colorado School of Mines, class 1902, and was in his 28th year at the time of the tragedy. Upon graduation, Mr. Ickis accepted a position as mining engineer in Sonora, Mexico, and remained there until 1903, when he accepted a position with the Philippine Division of Mines. He was very well and favorably known among the miners and prospectors of the Philippines by whom the sincerest regret is expressed at his untimely passing. He was the author of several short papers on the geology and mineral resources of the Philippines.

FAR EASTERN ENGINEERING, CONSTRUCTION, COMMERCIAL AND FINANCIAL NEWS

ELECTRIC RAILWAYS, LIGHTING, POWER, TELEGRAPH LINES, AIRSHIPS, ETC.

WIRELESS IN MINDANAO.—A field wireless equipment has been landed at Malsbang for use of the troops there.

YOKOHAMA TELEPHONE SYSTEM.—The installation last month of 400 new phones brings the number of subscribers up to 2,227.

OSAKA MUNICIPAL TRAMS.—The system of electric trams has been completed and the rates charged make it cost 10 sen from one end of the city to the other extremity or 2 sen a ward.

WUHU ELECTRIC LIGHTING.—A company has been formed for the purpose of installing an electric plant at Wuhu and permission has been granted to the company to proceed with the work.

TOKYO LONG DISTANCE TELEPHONE.—This service connecting Tokyo and Yokohama with Sendai, Yamagata and Fukushima, has been in operation since the last of March and is giving general satisfaction.

JAPANESE AIRSHIP.—Yamada Isaburo, the airship inventor, has perfected a machine which he claims is capable of resisting a wind force of 15 meters a second. Trial trips were successfully made recently at Tokio.

TIENSIN CITY TRAMWAYS.—The extension of this system to include the French concession is now under way. The line will begin at the Southern end of the Japanese concession and proceed along the Rue l'Amirauté to the French Bund.

NAGOYA HYDRO-ELECTRIC PLANT.—The contract for the installation of this plant has been secured by the General Electric Company. When completed power will be generated at 6,600 volts by four 3-phase, 2,500-kw, 60 cycle, 360 revolution, water-wheel driven motors.

ELECTRIC INSTALLATION IN DUTCH OIL FIELDS.—The plant of the Royal Dutch Petroleum Co. on its oil fields in East Sumatra is being equipped with an up-to-date electric generating plant. The substitution of electric power, it is estimated, will reduce the cost of operation by ten per cent.

CHINESE TELEGRAPHS.—The ministry of posts and communications have authorized the purchase of shares in the Chinese Telegraph company at the rate of \$110.00 for every \$100 share. The shares will be redeemed at the offices of the Chinese National Bank at Peking, Tientsin, Hankow, Shanghai or Canton.

WIRELESS IN CHINA.—The recommendation of Sir John Jordan, that the Imperial government of China establish wireless stations at convenient points along the entire sea coast of the empire is being favorably considered at Peking and not a few stations have been authorized and established in Northern and Southern China.

KOHSICHANG CABLE LAID.—The latest reports from Bangkok, indicate that the cable connecting Kohsichang with the mainland has been completed by the Eastern Extension Telegraph Co. for the minister of public works of Siam. This puts the Siamese central government in direct touch with the police power of the island.

KOBE-OSAKA ELECTRIC CO.—The three million yen loan of this company has been placed with the firm of Messrs. Samuel Samuel & Co., the bonds carrying 6% redeemable in six years. The firm advancing the loan agrees to provide for the investment of 2,700,000 yen in a plant. The work of construction will begin as soon as the plans have been submitted and approved.

PORT ARTHUR-CHEFOO CABLE.—The Japanese government has decided to repair the cable which was cut during the war by the Russian government. It is claimed to be a legitimate prize of war. It was laid by the Great Northern Telegraph Company in 1901 under instruction of the Russian government and no attempt has been made by the company to repair it since the war.

TOKIO ELECTRIC POWER AND RAILWAY AGREEMENT.—The railway has agreed to purchase from the power company commencing July 1st, 1910, a maximum of 10,000 kil. per hour at 1.6 sen per kil. per hour and for the year following a maximum amount of 15,000 kil. an hour at the same price to be continued for ten years. By this agreement the railway will save at least 30% on the cost of power.

AUCKLAND ELECTRICAL INSTALLATIONS.—The municipality has authorized the installation of an electric lighting plant to cost \$125,000 and a company has been formed with a capital of \$500,000 for the installation of a ferry service across the bay and further connection with Auckland by a tramway with Lake Takapuna, a distance of 10 miles. The material is being supplied from the United Kingdom.

JAPANESE WIRELESS SERVICE TARIFF.—The Tokyo government has authorized a charge of 25 sen for five European words and five sen each for additional words for messages sent from the stations on shore to steamers out to sea. The maximum distance between station and ship has been fixed at 120 miles. Stations have been established at Choshi, Shiowomisaka, Osezaki and on Tsunojima. Every telegraph office in the empire is authorized to take messages for these stations for transmission to steamers at an additional charge of 20 sen.

RAILWAYS AND RAILWAY SUPPLIES

CHEKIANG RAILWAY.—The section connecting Hangchow with Ningpo was opened to the public May 14th.

CHENGCHOW-HONANFU EXTENSION.—The progress on the construction of this extension of the Kaifeng line is progressing slowly.

KEELUNG-TAKAO RAILWAY.—This new line which was recently opened to traffic cost 25,000,000 yen and took about 14 years to complete.

BRANCH OF PEKING-HANKOW TO SHANGHAI.—It was decided at a meeting of the directorate on May 19th to construct a branch line to Shanghai.

PEKING-KALGAN EXTENSIONS.—Extensions from Kalgan to Kulun, to Jehol, and to Suiyden are proposed and will probably be constructed at an early date.

CHENGTING-TAICHOW BRANCH.—The Belgian Syndicate began the construction of this branch which is to be a feeder of the Peking-Hankow Railway, early in May.

RAILWAY TO TURKESTAN.—The military governor of Ili has asked permission of Peking to draw on the gold deposits of the province for the construction of a line from Ili to Chinese Turkestan.

SHIMBASHI-KOBE EXPRESS.—With the completion of the doubling of the line between Toyohashi and Kamagori and Okazaki and Anjo, it is the purpose to reduce the time between Kobe and Shimbashi.

TIENSIN-PUKOW RAILWAY.—The proposed route of this line will very probably pass through Suchow, Linpi, Fengyang, Tingyuan and Chochow and thence to Kiang-Pu-Hsien to come out at Pukow.

AUSTRALIAN RAILWAYS.—During the fiscal year 1907 the Australian lines which cost over £137,000,000 yielded 4.35% on the investment which defrays all interest charges and leaves a surplus of £992,947.

JOHORE AND F. M. S. RAILWAY JUNCTION.—Gemias has been selected as the junction of the Johore railway and the Federated Malay States Railways, and the railway shops, etc., are now under construction at that point.

PENANG HILL RAILWAY.—The legislative council of the Straits has decided to purchase Strawberry Hill for the purpose of altering the sharp curves on this line which interfere with the successful operation of the road.

TOKIO RAILWAY CENTURY.—The director of this company proposes celebrating the completion of 100 miles of track under its control in the near future. With the completion of two small branches the mileage will reach 105 miles.

YOKOHAMA-TOKYO DOUBLE LINE.—The railway bureau proposes the construction of a double line connecting these two points for the purpose of being prepared to handle the increased traffic incident to the exposition of 1912.

JAPANESE REFRIGERATING CARS.—Twenty refrigerating cars for the railway works at Omiya at a cost of yen 3,000 a car. Thirty additional cars are now under construction and will be placed on the Tokkaido line. These cars carry two tons each.

LABOR FOR ANHUI RAILWAY CONSTRUCTION.—The indisposition of the natives of Anhui to work on the railway there has necessitated the employment of several thousand laborers who worked previously on the Shanghai-Nanking Railway construction.

FRENCH RAILWAY ENTERPRISE.—The railway from Tonkin is now completed half the distance to Mengtze and is expected to arrive at that point in October. The earthworks and masonry have been completed 180 miles beyond this point and the station at Yunnan is ready for occupancy.

TSITSIHAR-ANANCHI RAILWAY.—The contract for the construction of this line in Northern Manchuria covering a distance of 20 miles has been let by the Chinese government to Messrs. Telge & Schroeder of Tientsin. The materials will be supplied by this firm and construction will begin in July.

WESTERN AUSTRALIA EXTENSIONS.—Work has commenced on the Wanneroo extension and tenders have been invited for the construction of the Narrogin-Wickepin Line. The extension of the Preston Railway to Boyup, according to the *Australian Hardware Journal*, was delayed owing to the scarcity of water.

AMOY RAILWAY.—According to the correspondent of the *China Mail*, the station at the Amoy end is a fine, substantial building and shops are being built for the German and American locomotives. The work of construction is progressing slowly. A consignment of 20,000 sleepers have arrived but the white ants are causing trouble with this material.

GAN-ETSU RAILWAY.—The construction of the extension of this line between Kitakaka and Niitsu through the mountainous district and which, when completed will be 50 miles in length, is in progress from both termini. It is expected that it will take over four years to complete this branch owing to the difficult character of the country and the engineering problems involved.

MANCHURIAN BROAD GAUGE.—The South Manchuria Railway Company has met with remarkable success in the opening of the broad gauge and last month the line was opened from Tairen to Mukden. The section between Changchun and Kunchuling was opened on May 21st; to Tieling May 22, and to Mulden May 25. First class accommodation including sleepers and dining cars will be available as soon as the stock arrives from America.

THE AMUR RAILWAY.—The construction of this important line while authorized by the Duma will probably be delayed indefinitely. The route also has not yet been decided upon although a number of schemes have been submitted. It is understood that the line will run through Russian territory and will probably start from Karymskaia, on the Trans-Siberian Railway, and finish at Khabarovsk, it will be about 1,320 miles long, and cost over £21,000,000. In these circumstances the Trans-Siberian Railway will be duplicated from Omsk to Karymskaia, at a probable cost of £13,160,000, which, together with the cost of construction of the Tiumen-Omsk and Amur Railways, amounts to a grand total of £37,528,420.

PUBLIC AND PORT WORKS, DOCKS, WHARVES, ETC.

IPOH MARBLE QUARRY WORKS.—These works have met with the greatest degree of success and a large order of new and modern machinery is being installed.

SAIGON WATERWORKS SYSTEM.—Plans and specifications have been completed for the construction, equipment, and installation of an extensive waterworks system at Saigon.

CEBU WATERWORKS.—The Philippines government has authorized the municipality of Cebu to issue bonds to the value of P200,000 for the purpose of providing the city with an up-to-date water system.

AMERICAN CONSULAR BUILDINGS.—Congress has authorized the expenditure of \$1,373,643 for the purchase of sites and the erection of consular buildings thereon, at Shanghai, Hongkong, Yokohama, Chemulpo, Nagasaki, etc.

NEW HAIHO RIVER BRIDGE.—The expenditure of Tls. 150,000 has been authorized for the construction of a bridge over the Haiho river at Chia-Chia Ta-chiao. The bridge will be of iron and replace the wooden structure at that point.

YOKOHAMA HARBOR WORKS.—The constructing engineer in charge of these works has submitted plans for the construction of sheds and railways in connection with the new docks, together with some amendments to the original draft.

PORT OF TUNGCHOW.—The work of improving the foreshore and reclaiming the necessary area for the establishment of a handsome bund has been under way at this point for some time, preparatory to the opening of the port to foreign trade.

SUNGEI BESI WATERWORKS.—At a recent meeting of the Sanitary Board of Kuala Lumpur, it was decided that it would cost more than the Resident would consider to provide the town with a water system and the scheme was abandoned. The sum named by the Resident was \$15,000.

PEKING WATERWORKS.—A Chinese company organized with a capital of Tls. 1,000,000 and known as the Peking Waterworks Co. has been granted a concession by the authorities to install a complete water system for the Chinese capital. Taotai Chow Hsuth-hsi is the chief promoter.

WATER TOWER AT TIENSIN.—An additional twenty feet is being added to the height of the water tower which will give an additional pressure to the city hydrants there. The materials used are fire bricks supplied by the Chinese Engineering and Mining Co. and cement by the Green Island Cement Co.

HAINAN NAVAL BASE.—Peking has authorized the taotai of Hainan, through the Viceroy, to proceed to Yulin Bay and make the preliminary survey with a view to establishing a naval station to be used as a base for the South China Squadron and to arrange for the construction of fortresses and railways at that point.

PENANG RECLAMATION.—The dredging operations in the harbor have been highly satisfactory and the area in front of Swettenham Pier, Church Street Ghaut Wharf and the South Channel has been dredged at an average cost of 6.43 cents per ton. The dredge Crab and the tug Puffin were purchased by the department for this work.

YOKOHAMA WATERWORKS.—The chief engineer of the Yokohama Waterworks has drafted a scheme for the extension of the system that would entail the expenditure of yen 7,000,000. He proposes to begin the work in 1910 and finish it in five years and to redeem the loan necessary to meet the expenditure he recommends the raising of the water rates by 20%.

REINFORCED CONCRETE WHARF AT ADELAIDE.—The Colonial Sugar Refinery Co. of Adelaide has completed plans for the construction of a reinforced concrete wharf. The piles will be made on the spot. The *Australian Hardware* states that this is the first of the kind proposed in South Australia and more construction of the character same will follow if successful.

MACAO PUBLIC IMPROVEMENTS.—A decree issued from Lisbon authorizes the expropriation of the lands in the Chinese Bazar section of the city for the purpose of extending the work of public improvement of the city. The program arranged by the governor of the colony has not met with the loyal support from Lisbon and little progress has been made in public works.

MALDIVES ISLANDS IMPROVEMENT.—The Sultan of these islands has secured the services of a dredge and is busy deepening the harbor at Male. According to the rate at which the work is progressing, the entire harbor will be dredged to a depth at the minimum of 12 feet in two years. In addition to the harbor work, the Sultan is constructing a road around Male which will be 60 feet wide and built of gravel and coral.

SHIPBUILDING, GENERAL MARINE AND FISHERIES

CHINESE-MARINE SERVICE.—Two steamers have been added to the service between Antung and Chefoo, Yingkow and Tientsin by the C. M. S. N. Co. These vessels are of 1,200 tons each.

MANCHURIAN NAVIGATION.—The Peking government has directed the Chinese authorities in Manchuria to regulate and otherwise protect and encourage traffic on the three rivers of prominence in that region.

SIBERIAN COAST FISHERIES.—The Douma is considering a bill providing for the protection of the fisheries off Kamchatka and in the Sea of Okhotsk. Patrol boats and a staff for running down poachers are provided for in the bill, and will be under the supervision of the Amur Financial office.

HIRANO MARU LAUNCHED.—This vessel being constructed by the Mitsui Bishi Dockyards was launched on April 21st and is a sister ship of the *Kumo Maru* recently launched from the same yards for the Nippon Yusen Kaisha. Her dimensions follow:
Length, 482 ft. 9 inches; Breadth, 56 ft.; Depth, 34 ft. 6 inches; Displacement, 15,750 tons; Gross tonnage, 8,770 tons; Speed 16 knots; Horse power 7,300.

TRANS-PACIFIC RATE CUTTING.—By arrangement with the Canadian Pacific the Chargeurs Réunis has organized a service whereby Europe can be made from Yokohama in 26 days. The service began last month and provides three steamers on a thirteen day schedule from Yokohama to Vancouver. Other steamers will take in Seattle, San Francisco and South American ports back to Europe. The passenger rate across the Pacific has been reduced to \$155.00 and will be further reduced to meet competition. Two freight steamers have also been put on the Pacific run connecting Japanese and Pacific ports.

MISHIMA MARU LAUNCHED.—The largest vessel turned out by the Kawasaki Dockyard was launched on April 18th. It is being constructed for the Nippon Yusen Kaisha and is a steel vessel, 1,100 A 1, built in conformity with the Imperial Japanese Shipbuilding Encouragement Law. She is 465 feet long, 56 feet wide, and 34 feet deep, gross tonnage 15,800, and, register tonnage 8,600. She is to be fitted with twin screw triple expansion, surface-condensing engines of 7,300 horse-power, and her speed is designed at 16 knots. It is expected that the vessel will be ready for her maiden voyage in the autumn.

MINES, MINERALS AND THE METAL TRADE

MINERAL EXPORT CO.—A company has been formed in Tonkin with a capital of \$270,000 for the purpose of exporting minerals from the province of Tuyenquang.

NEW ZEALAND GOLD EXPORT.—The export of gold bullion from New Zealand for 1907 was valued at \$9,867,118 a falling off of 55,633 oz. compared with the previous year.

BORNEO EXPLORATION.—The British Borneo Exploration Co. has increased the reward for the discovery of valuable mineral deposits in North Borneo from \$5,000 to \$10,000.

PING HEUNG MINES.—The output of these mines continue at about 1,000 tons daily. The recent explosion did little damage and in no way affected the capacity of the mining plant.

THE PUN YU COAL CONCESSION.—The Sin Hau Kuk has taken over the interest of the French mining company that recently abandoned its claim on account of losses sustained in operating the works.

FENGHUANGSHAN IRON MINES.—It is understood that the Peking Syndicate has secured a concession to develop these iron deposits and will finance the enterprise with the funds secured for its Shansi concessions.

OIL COMPANY'S PURCHASE.—The Namboku Kerosene Oil Co. has made arrangements to purchase the property of the Asand Oil Co. for Yen 1,000,000, and will increase its capital to Yen 4,000,000 for the purpose of handling the deal.

BURMA OIL COMPANY'S PIPE LINE.—The transportation of oil from the Yenanyaung oil fields to the pumping station at Pyinbinhla has been very successful. Over 1,500 tons were delivered at one time on the tank barges and towed to Rangoon successfully.

FORMOSAN OIL DEPOSITS.—Several applications for licenses for permission to development of oil deposits in the provinces of Tainan, Kagi, Yensuiko, Banshoryo and Byoritsu are being entertained by the Formosan government, says the *South China Morning Post*.

MINING MAGNATE BANKRUPT.—The *Japan Mail* announces the bankruptcy of Yamagata Yuzaburo, the mining magnate of Hokkaido, and that the valuable sulphur mine at Hokkaido and the copper deposits in Iwate prefecture will become the property of Messrs. Samuel, Samuel & Co.

MINING IN SHANSI.—The Chinese Mining Co. of Taiyuan has secured control of the properties of the Peking Syndicate in that section recently relinquished and has secured subscriptions for 5,000,000 Tls. of stock, the funds to be used in developing the coal and iron deposits at Pingtingchou. It is the purpose of this company to establish an iron foundry in connection with these mines at an outlay of Tls. 1,000,000, most of the machinery having already been selected in Europe.

SOUTH CHINA COAL.—The Wuchow correspondent of the *South China Morning Post* writes that 30 tons of good coal arrived from the Fu River at that point and the belief is expressed that there are valuable deposits there awaiting modern machinery for development. The Canton correspondent of the *China Mail* announces that the coal mines at Shaochow which are being worked by the local government are progressing very favorably and, with better transportation facilities, the future would be assured.

SOUTH BURMA TIN.—The Indian government is making a comprehensive survey of the deposits of tin in this section. According to the *Bangkok Times*, during the past two years, the output of tin ore from the mines in the Mergui and Tavoy districts having advanced from 1,495 cwts., valued at £9,783, in the fiscal year 1905-06, to 1,919 cwts., valued at £13,574, in 1906-7. A few fresh prospecting licenses for tin were issued during the calendar year 1906 for the Mergui district, which is the centre of the industry at present.

FINANCIAL AND MISCELLANEOUS

JAVA SUGAR CROP.—The sugar crop for the year 1907 amounted to 19,444,288 pikuls.

CHINESE CENSUS.—It is announced from Peking that the minister of the interior will take a census of the entire empire at an early date.

TO COLONIZE SIBERIA.—According to the plans of the Russian government, 3,500,000 immigrants will be dispatched to this region during the next three years.

DUTIES COLLECTED AT CHIEYUKWAN.—The viceroy of Shensi and Hansu reports that Tls. 70,000,000 were collected in duties at that point chiefly on Russian goods imported.

CHINESE BANK NOTES.—It has been decided by the Board of Revenue at Peking that all officials, employees and soldiers of the Empire shall be paid in Chinese National Bank notes.

FIRE AT SHANGHAI.—The report has been received that the premises of the Shanghai Oil Mills and the China Import Lumber Co.'s Mills at Tangtszepoo were destroyed by fire on May 22nd.

HOKKAIDA SAVINGS BANK FAILURE.—With the suspension of this institution and its branches, it is estimated that in all the petty bank suspensions in Japan over 20,000,000 yen were involved.

JAPANESE CHAMBER AT TIENSIN.—Official permission has been obtained from the Chinese authorities for the establishing of a chamber of commerce, comprised of Chinese merchants at that point.

SANDAKAN CHINESE CHAMBER.—The leading Chinese merchants in British North Borneo have organized a chamber of commerce for the purpose of advancing the interests of the Chinese colony there.

EAST SUMATRA TOBACCO.—The Bah-Boelian Tobacco Co. has been formed with a capital of 1,500,000 florins for the purpose of working certain concessions in Sumatra and establishing a general commission business.

JAPANESE MUNICIPAL LOANS.—The government has sanctioned the Osaka, Kyoto and Nagoya loan issues of eleven million, ten million and eight million yen respectively. They will be offered in small instalments.

CHINESE LEGATION AT BANGKOK.—The expenditure of half a million taels has been authorized by Peking for the construction of a handsome legation building at Bangkok and consular buildings at other points in Siam.

JUNK BAY FLOUR MILLS.—Chinese capitalists are reported interested in the purchase of the properties of the Hongkong Milling Co. with a view to handling the North China and Korean wheat for the Chinese market.

CHINESE SPINNING AND WEAVING FACTORIES.—The machinery in the hands of the Tartar-General Ili has been ordered to Peking and under the direction of the government a spinning and weaving factory will be established there.

SELANGOR FIRE FIGHTING APPARATUS.—A petrol motor hose tender with a speed of 26 miles an hour is now a part of the equipment of the fire department there. This motor is an adjunct to the fire engine motor recently secured.

FIRE INSURANCE COMPANY OF TIENSIN.—The Peiyang Fire and Marine Insurance Co. is the name of a new organization with a capital of taels 1,000,000 promoted by the Chinese merchants of Peking and Tientsin. The head office is at Tientsin.

AMERICAN MANUFACTURERS TO INVAD E ORIENT.—The Illinois Manufacturers' Association has completed arrangements to send 200 representatives to Eastern Asia to investigate conditions and inquire into the best method of developing American trade.

NEW SUMATRA RUBBER CO.—The Sialang, Limited, is the name of a company organized to develop a tract of 1,645 acres in Serdang, Sumatra and the *Malay Mail* remarks that this is evidence of the tendency on the part of capital to seek fresh fields and pastures new.

INTERNATIONAL BANK'S KOBE HOME.—The new bank building was occupied by the International Banking Corporation on April 21st. The building is an imposing structure situated at 30 Akashimachi, Kobe, and is provided with the most modern equipment in vaults, etc.

JAPANESE TEA EXPORT.—The export for the year just ended amounted to 10,293,000 kin, a decrease of about half a million kin compared with the previous year but the value received showed an increase of Yen 358,228 on the entire export owing to the advance in price.

DECLINE IN JAPANESE BANK DEPOSITS.—According to the Japanese papers, the deposits in 400 of the principal banks in Japan have fallen off about 300,000,000 yen and that the deposits in over two thousand banks throughout the country standing at about 1,658,000,000 yen at the end of January last, suffered a proportionate decline.

SIBUGUEY FOREST TRACT.—The concession obtained by Messrs. Williamson & Redding, lumbermen, on the eastern coast of the Zamboanga peninsula, Mindanao, contains about 180 square kilometers. Of this area, says the *Mindanao Herald*, 55% is cogon-grass land and 15% salt water swamp, leaving 30% for commercial timber.

BRITISH CORPORATION ORDINANCE.—A notice appears in the *Hongkong Gazette* informing managers, secretaries and other officers of companies whose duty it is to furnish annual returns of shareholders under the Companies' Ordinance 1865 that in future there should be added to the names of Chinese shareholders the Chinese characters for such names.

COMPANIES STRUCK OFF.—The *Hongkong Gazette* gives the following list of companies struck off the register: The Canton and Hongkong Tug, Lighter and Ferry Company, Limited; the Tak On Insurance Exchange and Loan Company, Limited; the Oriental construction Company, Limited; the Woosung Forts Launch Company, Limited; and the Chindah Steam Navigation Company, Limited.

INVENTION OF PAPER TILES.—Manjiro Suzuki, a native of Shizuka, is reported to have invented a new type of tile made of paper board. Some time ago an idea caught him to make tiles by use of wasted paste-board. After many years' study he succeeded in making an ideal type proof against rain and fire. His product is by far lighter than the common earthen tile and saves the labor in roofing. Moreover its price is cheaper by 30 to 50 per cent than the ordinary clay made ones. The inventor has applied for a patent.

JAPANESE SHIPPING SUBSIDIES

Referring to the extent of the Government protection given to the shipping business in Japan at the present time, the *Tokyo Nichi-Nichi* observes that the policy of protection or encouragement for shipping pursued by the various countries in the world may be divided into six sections—mail subsidy, subsidy for naval service, tonnage, shipbuilding, navigation encouragement, and military transport. The method now adopted by Japan is almost identical with the policy followed by France and Italy, allowing subsidies for the transport of mails, extension of steam services, and shipbuilding and navigation encouragement. The total estimate of the shipbuilding subsidies to be granted in Japan for the present fiscal year, as included in the Budget, amounts to ¥13,190,695 (including ¥800,000 to be granted by the Formosa Government). Of the subsidies for steam service extension and steam navigation and shipbuilding encouragement, the Nippon Yusen Kaisha takes about ¥7,000,000 (including a subsidy to the Formosan line, and the services under contract with the Hokkaido Government), the Toyo Kisen Kaisha about ¥1,760,000, and the Osaka Shosen Kaisha about ¥700,000 (including the Formosan line and the Japan Sea service). Details of the building subsidies, which are estimated at ¥13,190,695 in all for the present fiscal year, are as follows, the steam navigation details being given in round figures:—

1.—STEAM SERVICE EXTENSION SUBSIDIES (¥7,686,300).

1.—Nippon Yusen Kaisha.....	¥4,283,707
2.—Toyo Kisen Kaisha.....	1,013,880
3.—Japan-China S. S. Co.....	800,000
Osaka Shosen Kaisha.....	491,000
4.—Osaka Shosen Kaisha, Awa Kyodo S. S. Co., and Mr. Marada Jujiro for calling at certain ports.....	50,000
5.—Nippon Yusen Kaisha, and eight others for services under contracts with local governments.....	247,713
6.—Nippon Yusen Kaisha and Osaka Shosen Kaisha for Formosan services.....	800,000

II.—STEAM NAVIGATION ENCOURAGEMENT
SUBSIDY (Y3,483,955).

1.—Nippon Yusen Kaisha.....	Y2,200,000
2.—Toyo Kisen Kaisha.....	750,000
3.—Mitsui Bussan.....	230,000
4.—Osaka Shosen Kaisha.....	200,000
5.—Mitsui Bushi.....	100,000

III.—SHIPBUILDING ENCOURAGEMENT
(Y1,995,440).

The receivers of this subsidy are the Mitsu Bishi Yard at Nagasaki, the Kawasaki Yard at Kobe, and the Osaka Iron Works, but the estimate for this purpose every year fails short of the amount required.

IV.—GRANT FOR TRAINING SEAMEN
(Y25,000).

1.—Grant to the Seamen's Relief Society.....	Y 5,000
2.—Grant to the Imperial Sea Distress Assistance Society.....	20,000

In this connection it may be added that according to the Japanese Press, during last year one battleship, two armoured cruisers, and one second class cruiser were launched at the Imperial Naval Yards, and one dispatch-boat each at the Mitsu Bishi and Kawasaki Yards. The Mitsu Bishi Yard has in hand orders for the construction of vessels representing 80,000 tons in all, including a sister-ship of the "Tenyo" and "Chiyo," and the Kawasaki Yard orders for vessels representing a total of 35,000 tons. The number of vessels built in Japan during last year is given as follows:—

	No. of Vessels.	Tonnage.
Imperial Naval Yards.....	4	53,100
Mitsu Bishi Yard.....	6	37,698
Kawasaki Yard.....	13	17,417
Osaka Iron Works.....	17	6,729
Ishikawajima Yard.....	6	1,330
Uraga Yard.....	2	89
Others.....	100	11,355

—Japan Chronicle.

CANTON-HANKOW RAILWAY STATEMENT

The first number of the official report of the directors of this company issued recently contains the information that the receipts of the company from all sources for the year 1907 amounted to taels 388,678,495 which added to the amount brought forward from 1906 made a total of taels 5,691,974.43. The disbursements for the year amounted to taels 2,030,894,385. Tenders for the earthwork on section six were advertised for and the contract awarded at taels 224,400.

Tenders for the supply of sleepers, and other materials have been submitted by Messrs. Arnhold, Karberg and Company, Messrs. Carlowitz and Company, Messrs. Jebsen and Company, Mitsui Bussan Kaisha, Messrs. Dodwell and Company and Messrs. Siemssen and Company.

PHILIPPINE MINING NOTES

Typhoon weather obstructed the work of the Bua Mining Company of Baguio, Benguet, during the month of May. The flume became obstructed and the tramway damaged somewhat by the flood. Repairs are however under way and there will be no serious delay.

The Benguet Consolidated also suffered slightly from the storm, but everything was repaired in about 36 hours. The six stamps are now in operation.

Manager A. J. MacDonald of the Tambaga Mining Co. operating on the old Tambaga workings in the Camarines, left for the scene of operations, the latter part of May, with pumping equipment, and it is believed that within 30 days the water will be taken off to the workings at 100 feet. This mine was abandoned in 1896 and part of the machinery still remains in good order. The mine has been flooded since that time. The Tambaga is considered a rich property and produces free milling ore of a high grade. The company is one recently formed and referred to in the FAR EASTERN REVIEW some time ago.

CURRENT NEW YORK WHOLESALE PRICES OF
METALS, MINERALS, CHEMICALS, ETC.

Selected from the Engineering and Mining Journal		U. S. Currency.
ABRASIVES.—		
Bort, good drill quality.....	carat	\$ 85 00
Carborundum, grains.....	lb.	.10-.17
Corundum.....	"	.07-.10
Emery, grain.....	"	.035-.045
Pumice Stone, American powdered.....	100 lbs.	1.60-2.00
ACIDS.—		
Hydrochloric 20°.....	lb.	1.25-1.50
Nitric, 38°.....	"	4.25-4.625
Sulphuric, 66° bulk.....	ton	18 00
Aluminum Sulphate Com'l.....	lb.	1.25-1.75
Antimony, needle.....	"	.05-.065
Arsenic, white.....	"	.045-.05
ASPHALTUM.—		
Trinidad.....	ton	28 00-30.00
California.....	"	51.00-27.00
Bleaching powder, 35%.....	100 lb.	1.25-1.40
Blue Vitriol.....	"	5 50
Bone Ash.....	lb.	.02-.04
Borax.....	"	.045-.0.525
*Caps detonating.....	M.	7 50
CEMENT.—		
Portland, American.....	500 lbs. bbl.	1.55-1.60
Foreign.....	"	2.25-2.90
Rosendale.....	300 " "	.85
*Green Island.....	375 " "	2.65
*Alsen.....	"	2.75
*Dromedary.....	"	2.50
*Rizal.....	"	2.50
*Independencia.....	"	2.50
CLAY, CHINA.—		
American common.....	lg. ton	8 50-9 00
Foreign.....	"	10.00-17.50
COALS.—		
*Japanese.....	"	5 25
*Australian.....	"	5 50
Copper.....	lb.	.16-.16½
Dynamite 40%.....	"	.20
Redspar ground best.....	sh. ton	14 00
ierk, B.American.....	M.	30.00-40.00
Imported.....	"	30.00-45.00
Fire clay, St. Louis Mill.....	ton	2 50
Fuse-Blasting.....	1,000 ft.	7 50

Graphite-American ore, common.....	lb.	.01-10
Artificial.....	lb.	.06
Gypsum-Fertilizer.....	sh. ton	7 00
Powdered.....	sh. ton	12 10-20
Lead.....	lb.	.03½-.04½
Magnesite-Greece, crude, 95%.....	ig. ton	8.00-10.00
Bricks, domes.....	per M.	160-200
Manganese, pure, 98-99%.....	lb.	.06
Ore, 80-85%.....	sh. ton	20 00 to 50 00
Mercury, export flask.....	75 lbs.	36 00 39.00

PAINTS AND COLORS.—

Litharge American P'w'd.....	lb.	.06½-.06¾
Ochre, Am. Com.....	sh. ton	8 50-9.00
Paris green, pure, bulk.....	lb.	.26
Turpentine, spirits, bbl.....	gal.	.44-45
White lead, Am. dry.....	lb.	.05½-.06
Am. in Oil.....	"	.06½-.06¾
Zinc, white, Am. extra dry.....	"	.05½-.05¾
Phosphates, Acid.....	per unit	.65-.70
Florida hard rock.....	lg. ton	10.25-10.50
Land pebble 68%.....	"	5 25-5 50
Potassium Cyanide (98-99%).....	lb.	18-19
Platinum.....	oz.	27.00-29.50
Platinum, Scrap.....	oz.	20.00-21.00
Spelter.....	lb.	.053-.055
Nickel.....	lb.	.015-.06½
Cobalt unrefined.....	"	.20-.45
*Powder, black blasting A.....	lb.	.1½
*Judson.....	"	.130
Pyrite, Domestic Non-arsenical,		
lump.....	unit	.11-.11½
Imported non-arsenical lump.....	"	.13-.13½
Imported, arsenical.....	"	.12-13
Saltpeter crude.....	100 lbs.	4 50-5 00
Silica, Lump quartz.....	lg. ton	5 00-6 00
Ground quartz, ordinary.....	"	13 00-15 00
Glass sand, ordinary.....	"	2 75
Silver.....	oz.	.61½
Sodium cyanide (100% KCN).....	lb.	.18-.19
*Steel, octagon drill.....	lb.	.14
Sulphur, Louisiana prime.....	lg. ton	22 00
Roll.....	100 lbs.	1 85-2.15
Flowers sublimed.....	"	2 20-2 60
Talc-Domestic.....	sh. ton	15 00-25.00
Italian, best.....	"	35 00-40.04
Tin.....	lb.	.02
Zinc.....	"	.15
Dust.....	"	.05-.06½

*Manila quotation.

HEMP STATISTICS, 1st JUNE, 1908.

(Courtesy of C. S. NICHOLSON, Secretary Manila Chamber of Commerce.)

Arrivals of hemp at Manila up 31st May 1908.....	290,629 Bales
Arrivals of hemp at Cebu up 31st May 1908.....	112,183 Bales
Stocks on hand in Manila and Cebu on 1st January, 1908.....	402,812 Bales
TOTAL.....	129,359 Bales
Export to all ports to date 31-5-08.....	532,171 Bales.
Local consumption estimated at.....	396,253 Bales.
	2,000 " 398,253 Bales.
Total stocks at Manila and Cebu on 1st June, 1908.....	133,918 Bales.

EXPORT OF HEMP, MAY, 1908.

Date	Vessel	London	L'pool	Atlantic U. S.	Pacific East California	Continent	Australia	Other Pts.	T Bales
May	Fwd:—	119,345	46,516	102,812	14,407	22,374	5,794	15,102	326,350
" 1	Loongsang.....	407				117		200	724
" 2	Rubi.....	100	250			1,150		200	1,700
" 5	Taming.....							250	250
" 7	Kumeric.....				3,500			100	3,600
" 8	Yuensang.....							50	50
" 9	Peleus.....				1,180				1,180
" "	Yawata Maru.....							200	200
" "	Zafiro.....							250	250
" "	Sikh.....			10,875					10,875
" 11	St. Egbert.....	3,900							3,900
" "	Clan McMillan.....				1,500				1,500
" "	C. Lopez y Lopez.....		1,620						1,620
" "	Tsinan.....							2	2
" 12	Tean.....							40	40
" 15	Loongsang.....	1,200	800			575			2,575
" "	Rubi.....							150	150
" 16	Bombay Maru.....	7,200							7,200
" 18	Kumano Maru.....						1,190		1,190
" 21	Satsuma.....			4,850					4,850
" 23	Prinz Sigismund.....						140		140
" "	Shawmut.....				2,047			179	2,226
" 25	St. Egbert.....Cebu	6,100							6,100
" "	Kaifong.....Cebu							40	40
" 31	Poon.....Cebu	3,682	2,694			150			6,526
" "	Satsuma.....Cebu			13,067					13,067
" "	Sungking.....Cebu	50							50
LESS.....		141,984	51,880	131,604	22,634	24,366	7,124	16,763	396,355
		100			2				102
		141,884	51,880	131,604	22,632	24,366	7,124	16,763	396,253

FAR EASTERN STOCKS AND QUOTATIONS

Courtesy of Messrs. Kadoorie & Co., Hongkong, for May, 1908.

STOCK.	WHEN ESTABLISHED	CAPITAL	NO. OF SHARES	VALUE	PAID UP	RESERVE	WORKING ACCOUNT	DATE	LAST DIVIDEND.	Approximate Yield per cent. per annum at Pre-sent Quotation.*	CLOSING QUOTATIONS.
BANKS.											
Hongkong & Shanghai Banking Corporation	1865	\$15,000,000	120,000	\$125	\$125	{ o £1,500,000 s £13,500,000 a \$250,000 c £12,735 \$300,000	\$2,000,387	31-12-07	{ Final of £2 on old and £1-10/- on new shares for ½ year ending 31-12-07	5	{ \$750 £76-10/- \$51
National Bank of China, Ltd.	1891	£699,475 10	99,925	£7	£6	{ c £12,735 \$300,000	\$71,293	31-12-06	\$2 (London 3/6) for 1903.	...	\$51
MARINE INSURANCES.											
Canton Insurance Office, Ltd.	1881	\$2,500,000	10,000	\$250	\$50	{ i \$1,560,000 u \$219,058 \$401,959 £125,000	Nil.	31-12-06	\$20 for 1906.	8½	\$235 sellers
North China Insurance Co., Ltd.	1893	£150,000	10,000	£15	£5	{ o Tls. 100,000 f Tls. 48,942 s \$3,000,000 £90,000	Tls. 204,424	30-6-07	Interim of 7/6 ex 2½% for 1907.	6	Tls. 77½
Union Ins. Society of Canton, Ltd.	1867	\$3,100,000	12,400	\$250	\$100	{ o \$456,407 f £125,137.15 u \$434,434 \$100,000	\$2,506,001	31-12-07	{ Final of \$15 making \$45 for 1906, and interim of \$30 for account 1907	5½	\$795
Yangtze Ins. Association, Ltd.	1862	\$1,040,000	12,000	\$100	\$60	{ i \$199,032 f \$85,157	\$591,763	31-12-07	\$12 and bonus \$3 for 1906.	9½	\$152½
FIRE INSURANCES.											
China Fire Ins. Co., Ltd.	1870	\$2,000,000	20,000	\$100	\$20	{ x \$1,000,000 f \$346,097 \$13,802	\$372,432	31-12-07	\$6 and bonus \$2 for 1906.	8½	\$92 buyers
Hongkong Fire Ins. Co., Ltd.	1868	\$2,000,000	8,000	\$250	\$50	{ f \$1,323,941	\$428,047	31-12-07	\$27 for 1906.	8½	\$315
SHIPPING.											
China & Manila Steamship Co., Ltd.	1882	\$750,000	1) 30,000	\$25	\$25	\$7,000	\$1,035	31-12-07	\$1 for 1906.	...	\$16 sellers
Douglas Steamship Co., Ltd.	1883	\$1,000,000	20,000	\$50	\$50	{ i \$264,638 e \$96,988 \$250,000	Nil.	30-6-07	\$4 for year ended 30-6-07.	10	\$40
Hongkong, Canton & Macao Steamboat Co., Ltd.	1865	\$1,200,000	80,000	\$15	\$15	{ d. i. \$575,000 f \$75,279 \$20,000	\$16,437	31-12-07	\$1½ for 2nd half year making in all \$2½ for year ending 31-12-07	7¾	\$20¼ buyers
Indo-China Steam Navigation Co., Ltd.	1882	£600,000	{ 2) 60,000 (2) 60,000	£5	£5	{ i £60,000 £270,000	£3,694	31-12-06	{ 5/- @ ex. 2-2½ = \$2.24 per share for 1906	3½	{ \$38 \$24
Do. Do (Preferred)	1882	m									
Do. Do (Deferred)	1882										
Shanghai Tug & Lighter Co., Ltd.	1903	Tls. 1,500,000	{ 20,000 10,000	Tls. 50	Tls. 50	Tls. 75,000	Tls. 14,510	31-12-07	{ Final of Tls. 1½ making Tls. 3½ for 1907	{ 7½ 7½	{ Tls. 44 sellers Tls. 51 sales
"Shell" Transport & Trading Co., Ltd.	1898	£ 2,000,000	2,000,000	£1	£1	{ i £400,000 £1871	£172,370	31-12-06	{ Second Interim of 1/- (Coupon No. 9) for a/c 1907	4½	45
"Star" Ferry Co., Ltd.	1898 1900	{ \$200,000 10,000	{ 10,000 10,000	{ \$10 \$10	{ \$10 \$5	{ \$65,000 \$47,221	\$98	30-4-08	{ \$1.00 for year ended 30-4-07 50 cts.	{ 3½ 3½	{ \$25 ex div. \$15 ex div.
Taku Tug & Lighter Co., Ltd.	...	Tls. 1,500,000	12) 30,000	Tls. 50	Tls. 50	{ d Tls. 98,000 e Tls. 419,479 i Tls. 82,000 v Tls. 81,200 q Tls. 30,000	Tls. 18,730	31-12-06	Final of Tls. 2 making Tls. 6 for 1906.	12½	Tls. 49 sellers
REFINERIES.											
China Sugar Refining Co., Ltd.	1878	\$2,000,000	20,000	\$100	\$100	{ o \$345,741 e \$450,000 r \$56,848	Dr. \$79,371	31-12-07	\$8 for year ending 31-12-06.	...	\$125 buyers
Luon Sugar Refining Co., Ltd.	1882	\$700,000	7,000	\$100	\$100	none	Dr. \$135,132	31-12-07	\$3 for 1897.	...	\$22
Perak Sugar Cultivation Co., Ltd.	...	Tls. 350,000	7,000	Tls. 50	Tls. 50	Tls. 100,000	Tls. 8,935	31-8-06	Tls. 4. (8%) for year ending 31-8-06.	...	Tls. 77½ buyers
MINING.											
Chinese Engineering & Mining Co., Ltd.	1901	£1,000,000	1,000,000	£1	£1	{ d £150,000 h £54,390	£11,556	28-2-07	{ Interim of 1/6 (Coupon No. 10) for a/c 1908	7½	Tls. 15¾ buyers
Raub Australian Gold Mining Co., Ltd.	1892	£200,000	{ 150,000 50,000	£1	18-10 £1	{ £4,873	Dr. £11,358	31-3-07	No. 12 of 1/- = 48 cents.	...	\$8½
DOCKS, WHARVES AND GODOWNS.											
Fenwick (Geo.), & Co., Ltd.	1889	\$450,000	z 18,000	\$25	\$25	{ o \$53,601 e \$550,000 r \$26,806	\$3,726	31-12-07	{ \$1½ for year ending 31-12-06	...	\$13
Hongkong & Kowloon Wharf & Godown Co., Ltd.	1886	{ \$3,000,000 60,000	{ 60,000 50,000	{ \$50 \$50	{ \$50 \$50	{ t \$550,000 i \$26,806 £40,000 v \$50,000 \$100,000	{ \$3,556 \$441,442	{ 31-12-07 31-12-07	{ Final of \$1½ making \$3½ for 1907 Final of \$4 making \$8 for 1907	{ 6¾ 7½	{ \$52 sales \$103 buyers
Hongkong & Whampoa Dock Co., Ltd.	1866	\$2,500,000	50,000	\$50	\$50	{ v \$50,000 \$100,000	\$441,442	31-12-07	Final of \$4 making \$8 for 1907.	7½	\$103 buyers
Shanghai Dock & Engin'g Co., Ltd.	1906	Tls. 5,570,000	13) 55,700	Tls. 100	Tls. 100	{ Tls. 1,000,000 b Tls. 697,257 r Tls. 75,000 e Tls. 125,000	Tls. 10,459	30-4-07	Int. of Tls. 2½ for 6 months ending 31-10-1907.	7	Tls. 87 buyers
Shanghai & Hongkew Wharf Co., Ltd.	1902	Tls. 3,600,000	14) 36,000	Tls. 100	Tls. 100	{ b Tls. 697,257 r Tls. 75,000 e Tls. 125,000	Tls. 22,626	31-12-07	{ Final of Tls. 9 making Tls. 17 for 1907	7½	Tls. 226 buyers
LANDS, HOTELS AND BUILDINGS											
Anglo-French Land Investment Co., Ltd.	1906	Tls. 2,500,000	3) 25,000	Tls. 100	Tls. 100	Tls. 25,000	Tls. 6,531	29-2-08	Tls. 6 for year ending 29-2-08.	6	Tls. 100
Astor House Hotel Co., Ltd.	1901	\$750,000	4) 30,000	\$25	\$25	{ Tls. 30,000 Tls. 35,000 £10,000	\$10,908	30-6-07	\$2½ for year ending 30-6-07.	10½	\$22½ buyers
Astor House Hotel, Ltd. (Tientsin)	...	Tls. 200,000	4,000	Tls. 50	Tls. 50	{ e Tls. 10,000 \$1,000	Tls. 1,013	28-2-06	20 per cent. for 1906.	...	Tls. 70 sellers
Central Stores, Ltd.	...	\$751,845	16) 50,123	\$15	\$15	{ n. \$1,000 \$648,975	\$9,178	31-12-06	\$1.80 for 1906.	...	\$12½ sellers
Hongkong Hotel Co., Ltd.	1866	\$600,000	12,000	\$50	\$50	{ r \$	\$252	31-12-07	\$4 for 1st half-year ending 30-6-1907.	7½	\$95 sales
Hongkong Land Investment & Agency Co., Ltd.	1889	\$5,000,000	50,000	\$100	\$100	e \$250,000	\$36,915	31-12-07	{ Final of \$3½ making \$7½ for year ending 31-12-07	7	\$100 sellers.
Humphreys' Estate & Finance Co., Ltd.	1887	\$1,500,000	150,000	\$10	\$10	{ i \$217,426 e \$50,000	\$4,621	31-12-07	70 cents for 1907.	7	\$10 buyers

FAR EASTERN STOCKS AND QUOTATIONS—(CONTINUED.)

STOCKS	WHEN ESTABLISHED	CAPITAL	NO. OF SHARES	VALUE	PAID UP	RESERVE	WORKING ACCOUNT	DATE	LAST DIVIDEND	Approximate Yield per cent. per annum at Pre-sent Quotation*	CLOSING QUOTATIONS
Kowloon Land & Bldg. Co., Ltd.	1889	\$300,000	6,000	\$50	\$30	none	\$653	31-12-07	\$1½ for 1907	6½	\$26 buyers
Shanghai Land Investment Co., Ltd.	1888	Tls. 3,900,000	78,000	Tls. 50	Tls. 50	{ Tls. 1,523,045 } { e Tls. 170,000 }	Tls. 107,547	31-12-07	{ Final of Tls. 3 & bonus of Tls. 2 making in all Tls. 8 for 07. }	7	Tls. 119 sellers
Tientsin Land Investment Co., Ltd.	1902	Tls. 772,600	7,726	Tls. 100	Tls. 100	i Tls. 71,685	Tls. 811	31-12-07	{ Final of Tls. 3 making Tls. 6 for 1907 }	6½	Tls. 90.
West Point Bldg. Co., Ltd.	1889	\$625,000	12,500	\$50	\$50	none	\$1,541	31-12-07	{ Final of \$2.10 making in all \$4.10 for year endg. 31-12-07 }	8½	\$48 sales & b.
COTTON MILLS.											
Ewo Cotton Spinning & Weaving Co., Ltd.	1895	Tls. 1,000,000	5) 20,000	Tls. 50	Tls. 50	{ Tls. 150,000 } { Tls. 23,276 }	Tls. 8,807	31-10-07	Tls. 2½ for year ended 31-10-07	4½	Tls. 58 buyers
Hongkong Cotton Spinning, Weaving & Dyeing Co., Ltd.	1901	\$1,250,000	125,000	\$10	\$10	e \$60,000	\$14,269	31-7-07	50 cents for year ending 31-7-07	4½	\$11
International Cotton Manufacturing Co., Ltd.	1895	Tls. 750,000	6) 10,000	Tls. 75	Tls. 75	Tls. 150,000	Tls. 85,519	30-9-07	Tls. 6 for year end. 30-9-06 (8%)	---	Tls. 62 buyers
Laou-kung-mow Cotton Spinning & Weaving Co., Ltd.	1895	Tls. 800,000	8,000	Tls. 100	Tls. 100	none	Tls. 6,308	31-12-07	Tls. 8 for 1906	---	Tls. 77½ buyers
Soy Chee Cotton Spinning Co., Ltd.	1895	Tls. 1,000,000	2,000	Tls. 500	Tls. 500	i Tls. 28,257	Tls. 50,663	31-12-06	Tls. 50 for 1906	---	Tls. 260 sellers
MISCELLANEOUS.											
Bell's Asbestos Eastern Agency, Ltd.	1895	£5,377.10s	11) 8,604	12-6	12/6	£1,299	£638	31-12-06	1s. 3d. for 1906	9	\$ 7½
China-Borneo Co., Ltd.	1903	\$720,000	8) 60,000	\$12	\$12	\$25,000	Nil.	31-12-07	\$1.20 for 1907	11	\$11
China Light & Power Co., Ltd.	1901	{ \$550,000 }	{ 50,000 }	\$10	\$10	none	\$25,000	28-2-07	60 cents for year ending 28-2-06	---	\$7
Do. do. Special Shares	1907	{ 17) 50,000 }	{ 17) 50,000 }	\$1	\$1	none					
China Provident Loan & Mortgage Co., Ltd.	1898	a \$1,250,000	7) 125,000	\$10	\$10	{ \$120,000 }	\$3,593	31-12-07	80 cents for 1907	9	\$9 buyers
Dairy Farm Co., Ltd.	1896	\$187,500	25,000	\$7½	\$6	{ \$60,000 } { \$5,000 }	\$2,974	31-7-07	\$1.30 for year ending 31-7-07	6½	\$20
Green Island Cement Co., Ltd.	1889	\$4,000,000	400,000	\$10	\$10	\$12,000	\$5,078	31-12-07	{ Final div. of 75 cents making in all \$1¼ for 1907 }	11½	\$10½
Hall & Holtz, Ltd.	---	\$420,000	21,000	\$20	\$20	\$186,000	\$15,002	28-2-07	\$2½ for year ending 28-2-07	12½	\$20 sellers
Hongkong Electric Co., Ltd.	1889	\$600,000	60,000	\$10	\$10	none	\$9,231	29-2-08	{ \$1.00 and bonus 20 cents for year ending 29-2-08 }	7½	\$15½ buyers
Hongkong Ice Co., Ltd.	1881	\$125,000	5,000	\$25	\$25	k \$120,000	\$4,378	31-12-07	{ Final of \$15 making in all \$19 for 1907 }	8½	\$225 sales
Hongkong Rope Manufacturing Co., Ltd.	1883	\$500,000	50,000	\$10	\$10	\$100,000	\$8,191	31-12-07	{ Final of \$1.20 making in all \$2 for 1907 }	6½	\$30 buyers
Maatschappij tot Mijn-, Boschen Landbouwexploitatie in Langkat	1902	Gs. 2,500,000	25,000	Glds. 100	Glds. 100	{ Tls. 547,500 } { i Tls. 27,603 }	Tls. 17,127	31-10-06	Interim of Tls. 10 for first quarter	6½	Tls. 510 sellers
Peak Tramways Co., Ltd.	1907	{ \$750,000 }	{ 25,000 }	\$10	\$10	5,000	\$ 7,340	30-4-07	{ 80 cents on fully paid shares & 6 cents on \$1 paid shares for year ending 30-4-08 }	{ 6 } { 4 }	{ \$14 } { \$2 }
Do. (New)	1907										
Philippine Co., Ltd.	1904	\$750,000	75,000	\$10	\$10	none	none	31-12-07	None	---	\$8
Shanghai Gas Co., Ltd.	1903	Tls. 800,000	24,000	Tls. 50	Tls. 50	d Tls. 100,000	Tls. 6,603	31-12-07	{ Final of Tls. 4 making Tls. 7½ for 1907 }	7	Tls. 109 sellers
Shanghai-Sumatra Tobacco Co., Ltd.	1902	Tls. 600,000	9) 30,000	Tls. 20	Tls. 20	{ Tls. 24,820 } { u Tls. 75,000 }	Tls. 8,493	31-10-07	{ Final of Tls. 9 making in all Tls. 14 for 1907 }	---	Tls. 92½ sellers
Shanghai Waterworks Co., Ltd.	1881	£327,000	16,350	£20	£20	Tls. 190,000	Tls. 58,332	31-12-07	{ Final of 37½6 making in all 52½6 for 1907 }	15	Tls. 375 sales
South China Morning Post, Ltd.	1903	\$150,000	6,000	\$25	\$25	none	Dr. \$41 934	28-2-06	None	---	\$23 buyers
Steam Laundry Co., Ltd.	1902	\$100,000	20,000	\$5	\$5	none	78	31-5-07	40 cents for year ending 30-5-07	6½	\$6 sales
Tientsin Waterworks Co., Ltd.	1901	Tls. 200,000	2,000	Tls. 100	Tls. 100	{ Tls. 15,259 } { e Tls. 4,000 }	Tls. 201	30-4-07	Tls. 6½ for year ending 30-4-07	---	Tls. 97 sellers
Union Waterboat Co., Ltd.	1905	\$500,000	15) 50,000	\$10	\$10	none	\$111	31-12-07	50 cents for 1907	4½	\$11
United Asbestos Oriental Agency, Ltd.	1896	\$100,000	10,000	\$10	\$4	\$35,000	\$13,000	31-5-07	{ 80 cts. on 9,900 ord. shares & \$19.80 on 100 founders' shares for year ending 31-5-07 }	6½	\$13
Watson (A. S.) & Co., Ltd.	1886	\$900,000	90,000	\$10	\$10	{ \$300,000 } { \$25,000 }	\$5,482	31-12-06	Interim of 30 cts. for % 1907	6½	\$10 buyers
Weismann Limited	1904	\$17,500	175	\$100	\$100	\$6,700	\$13	31-7-07	10 per cent. for year endg. 31-7-07	---	\$165 buyers
William Powell, Ltd.	1901	\$150,000	15,000	\$10	\$10	none	\$41	30-6-07	{ Final of 30 cents making 80 cents for year ending June 30th 1906 }	---	\$5½ buyers

LOANS AND DEBENTURES.	AGENTS FOR THE LOAN.	AMOUNT OF LOAN.	PAR VALUE	OUTSTANDING BONDS.	WHEN PAYABLE.	CLOSING QUOTATIONS.
China Government, 7 per cent. Silver Loan 1886 E.	Hongkong & Shanghai Banking Corporation.	Tls. 767,200	Tls. 250	1914	Mar. 31st and Sept. 30th each year until Mar. 31st, 1917	par.
Hongkong Hotel Company, Ltd., 6 per cent. Mortgage Debentures of 1899 †.		\$500,000	\$500	\$ all	Half yearly, June 30th and December 31st	par.
Shanghai & Hongkew Wharf Company, Ltd., 6 per cent. Debentures of 1902		Tls. 543,900	Tls. 100	-----	Half yearly, June 30th and December 31st	Tls. 97
Astor House Hotel Company, Ltd., 8 per cent. Debentures of 1903		Tls. 500,000	Tls. 100	-----	Half yearly, January 1st and July 1st	par.
Chinese Engineering & Mining Co., Ltd., 6 per cent. Debentures of 1903 †.	Russo Chinese Bank	£500,000	£	£431,960	Half yearly, June 30th and December 31st	par.
International Cotton Manufacturing Co., Ltd. 7% Debentures of 1901		Tls. 500,000	Tls. 100		Half yearly, March 31st and Sept. 30th	Tls. 97½
China Light and Power Co., Ltd. 6% Debentures of 1907 ***		\$500,000	\$100	-----	Half yearly, June 30th and December 31st.	par.

a Authorized capital \$2,000,000.
b Building Reserve Account.
c Capital Reserve Fund.
d Depreciation Fund.
e Equalization of Dividend Fund.
f Exchange and Investment Fluctuation Account.
g Gold Reserve Fund
h Exchange Reserve Account.
i Insurance Fund.
j Reinsurance Fund.
k Contingencies Account.
l Legal Reserve Fund.
m Authorized Capital
n Sinking Fund.

o Raw Sugar Reserve Account.
p Premium on New Issue.
q Boiler Repairs and Renewals Account
r Repairs and Renewals Account.
s Silver Reserve Fund.
t Depreciation and Repairs Account
u Underwriting Suspense Account.
v Special account
w Special Works Fund.
x Extra Reserve Fund.
y 72,560 owned by the Company.
z 7,200 shares unissued.
1 5,725 shares unissued.
2 First issue of 60,000 of which 10,411 unallotted.

3 5,000 shares unissued.
4 4,480 shares unissued.
5 5,000 shares unallotted.
6 1,616 shares unallotted.
7 75,000 shares unissued.
8 14,000 shares unissued.
9 17,000 shares unissued.
10 40,453 shares actually issued.
11 7,688 shares actually issued.
12 4,200 shares unissued.
13 500 shares unissued.
14 198 shares unissued.
15 22,250 shares unissued.
16 10,000 shares unissued.
17 Special shares are entitled to half of the profits.

18 Capital contributed by Chinese Government, Kuping Tls. 5,000,000.
* Based on last year's dividend.
** Based on present dividend.
|| Only Tls. 134,000 taken up.
§ 216 held by the Company.
¶ In certificates of £20 and £100.
† Redeemable in 10 years, or at option of Company, the Company giving 6 months notice.
‡ Redeemable at par at rate of £10,000 per annum from 31st December 1903 to 31st December 1952.
*** Redeemable at par on 30th June, 1915.
Dr. Deficit.

ADDITIONAL SHANGHAI SHARE QUOTATIONS

STOCK	CLOSING QUOTATIONS	HIGHEST AND LOWEST PRICES DURING THE WEEK	CAPITAL	NO. OF SHARES	VALUE	PAID UP	RESERVE	LAST DIVIDEND	WHEN PAID
Oriental Consolidated Mining Co., Ltd.	27s. 6d.		G. \$5,000,000	500,000	G. \$10	G. \$10	none	Interim of Gold cents 50 for year ended 30th June 1907.....	May 1908
Wei-hai-wei Gold Mining Co., Limited	\$1 nominal		\$700,000	35,000	\$20	\$20	—	None	—
Kiang pei-ting Coal & Iron Mine Co., Ltd.	Tls. 50		Tls. 500,000	5,000	Tls. 100	Tls. 50	—	First year.....	Nov. 1, 1906
Vulcan Iron Works, Limited	Tls. 400		Tls. 500,000	1,000	Tls. 500	Tls. 500	—	Tls. 50 for year ended 31.8.06.....	April 16, 1908
Yangtze Wharf & Godown Co., Limited	Tls. 125 nominal		Tls. 250,000	2,500	Tls. 100	Tls. 100	Tls. 50,000	Tls. 18 for 1907.....	—
Wei-hai-wei Land & Building Co., Limited	Tls. 10 nominal		Tls. 91,850	3,674	Tls. 25	Tls. 25	—	—	—
Union Estate & Investment Co., Limited	Y. 105 sales		Y. 1,000,000	10,000	Y. 100	Y. 100	—	First year.....	Dec. 31, 1907
Grand Hotel, Limited	Y. 100 sellers		Y. 500,000	5,000	Y. 100	Y. 100	—	Interim Y. 5 for ½ year.....	May 29, 1908
Hotel des Colonies Company, Limited	Tls. 9 sellers		Tls. 112,500	9,000	Tls. 12½	Tls. 12½	Tls. 29,783	6% for 1907.....	May 22, 1908
Kalee, Limited	\$100 nominal		\$250,000	2,500	\$100	\$100	—	\$5 for 1907.....	May 24, 1906
Tsingtau Hotel Company, Ltd.	nominal		\$250,000	2,500	\$100	\$100	—	5% & 2% bonus for 1905.....	Mar. 12, 1908
Anglo-German Brewing Co., Limited	\$85 buyers		\$100,000	4,000	\$100	\$100	none	\$7 for 1907.....	May 29, 1907
Butler Tile Works, Limited	Tls. 50 nominal		Tls. 60,000	1,200	Tls. 50	Tls. 50	—	Tls. 3 for year ending 31.3.07.....	—
Major Bros., Limited	Tls. 40 sellers		Tls. 300,000	6,000	Tls. 50	Tls. 50	—	—	—
Oriental Ice Company, Limited	Tls. 50		Tls. 130,000	2,600	Tls. 50	Tls. 50	—	First year.....	—
Scharffs Oil and Bone Mills, Ltd.	Tls. 50		Tls. 200,000	4,000	Tls. 50	Tls. 50	—	First year.....	Mar. 14, 1908
Shanghai Ice Company, Limited	Tls. 13 sales		Tls. 200,000	8,000	Tls. 25	Tls. 25	—	3% for 1907.....	—
Shanghai Oil Co., Limited	Tls. 25		Tls. 175,000	7,000	Tls. 25	Tls. 25	—	First year.....	Apr. 2, 1906
Campbell, Moore & Co., Limited	\$10 buyers		\$12,000	1,200	\$10	\$10	\$9,000	\$3 for 1905.....	Apr. 15, 1908
Dunning & Company, Limited	\$50 sellers		\$100,000	2,000	\$50	\$50	—	\$5 year ending 28.2.08.....	May 16, 1908
J. Llewellyn & Co., Limited	\$50 buyers		\$72,000	1,200	\$60	\$60	—	\$6 for 1907.....	May 25, 1908
Lane, Crawford & Company	\$137½ sales		\$250,000	2,500	\$100	\$100	—	Final of 7% making 14% for 1907.....	—
Mondon (E. L.) Limited	Tls. 6 buyers		Tls. 225,000	9,000	Tls. 25	Tls. 25	none	—	—
S. Moutrie & Company, Limited	\$40 buyers		\$250,000	5,000	\$50	\$50	—	—	—
Weeks & Company, Limited	\$22 buyers		\$400,000	20,000	\$20	\$20	\$25,000	10% for year ended 28.2.08.....	Dec. 11, 1907
Dominion Rubber Co., Limited	Tls. 4		Tls. 225,000	22,500	Tls. 10	Tls. 4	—	First year.....	—
Kalumpang Rubber Co., Ltd.	Tls. 42 sellers		Tls. 700,000	14,000	Tls. 50	Tls. 50	** Tls. 11,844.48	—	—
Senawang Rubber Estates Company, Limited	Tls. 100		Tls. 250,000	2,500	Tls. 100	Tls. 100	—	—	—
Senawang Rubber Estates Company, New	Tls. 75				Tel. 100	Tls. 75	—	—	—
Tebong Rubber and Tapioca Estate, Limited	20s.		£76,000	76,000	£1	£1	—	—	—
Eastern Fibre Co., Limited	Tls. 10 nominal		Tls. 300,000	30,000	Tls. 10	Tls. 10	—	—	—
Shanghai Mercury, Limited	Tls. 50 buyers		Tls. 105,500	2,100	Tls. 50	Tls. 50	—	4% for half year ended 31 Oct. 1907.....	Dec. 17, 1907
Shanghai Mutual Telephone Co., Limited	Tls. 53½ buyers	53½	Tls. 675,000	13,500	Tls. 50	Tls. 50	—	Tls. 4 for 1906.....	—
China Export Import & Lumber Company, Limited	Tls. 92½ nominal		Tls. 350,000	500	Tls. 100	Tls. 50	—	10 p. c. for year ending 29.2.08....	May 1, 1908
China Printing Co., Limited	Tls. 50		Tls. 750,000	1,500	Tls. 50	Tls. 50	—	80 cents for 1907.....	Jan. 30, 1908
Dallas Horse Repository Co., Ltd.	Tls. 25 nominal		Tls. 250,000	5,000	Tls. 50	Tls. 50	—	—	—
Hirano Mineral Water Co., Ltd.	Y. 15 sales		Y. 125,000	5,000	Y. 25	Y. 25	—	(10%—yen 2½ for year ending 30th Sept. 07.....)	Nov. 21, 1907
E. E. Porter & Co., Limited	\$50		\$100,000	2,000	\$50	\$50	—	\$6 for 1907.....	Apr. 22, 1908
Shanghai Electric & Asbestos Company, Limited	\$23 sales		\$125,000	5,000	\$25	\$25	—	Interim of 4% for 1907.....	Jan. 15, 1908
Shanghai Electric Construction Company, Limited	£11 buyers	£11	£300,000	30,000	£10	£10	—	First year.....	—

DEBENTURES

LOANS	PRICE—PLUS ACCRUED INTEREST	AMOUNT OF LOAN	OUTSTANDING	NOMINAL VALUE	RATE OF INTEREST	WHEN PAYABLE
Shanghai Municipal Debentures	1892 Tls. 87	Tls. 50,000	Tls. 45,400	Tls. 100	5 %	June & Dec.
do	1893 " 92	" 125,000	" 47,300	" 100	5½ "	Do
do	1894 " 100	" 105,000	" 60,000	" 100	6 "	Do
do	1895 " 87	" 115,000	" 110,900	" 100	5 "	Do
do	1896 " 87	" 140,000	" 135,700	" 100	5 "	Do
do	1897 " 87	" 268,800	" 268,400	" 100	5 "	Do
do	1898 " 100	" 300,000	" 60,000	" 100	6 "	Do
do	1900 " 92	" 33,900	" 31,700	" 100	5½ "	Do
do	1901 " 100	" 250,000	" 200,000	" 100	6 "	Do
do	1902 " 100	" 150,000	" 150,000	" 100	6 "	Do
do	1903 " 100	" 490,500	" 490,500	" 100	6 "	Do
do	1904 " 100	" 214,500	" 214,500	" 100	6 "	Do
do	1905 " 100	" 320,000	" 320,000	" 100	6 "	Do
Chinese Imperial Government Loan	1886 E " 250	" 767,200	" 354,400	" 250	7 "	Mar. & Sept.
Shanghai Land Investment Co., Debentures	1890 " 99	" 250,000	" 250,000	" 100	6 "	May & Nov.
do	1892 " 92	" 250,000	" 250,000	" 100	5½ "	June & Dec.
do	1894 " 99	" 250,000	" 250,000	" 100	6 "	Mar. & Sept.
do	1896 " 87	" 250,000	" 250,000	" 100	5 "	June & Dec.
do	1900 " 99	" 250,000	" 250,000	" 100	6 "	April & Oct.
do	1901 " 99	" 250,000	" 250,000	" 100	6 "	June & Dec.
do	1901 " 92	" 100,000	" 100,000	" 100	5 "	May & Nov.
do	1902 " 99	" 400,000	" 400,000	" 100	6 "	June & Dec.
do	1905 " 99	" 250,000	" 250,000	" 100	6 "	Do
Shanghai Waterworks Co., Debentures	1894 " 99	" 100,000	" 100,000	" 100	6 "	Mar. & Sept.
do	1896 " 87	" 100,000	" 100,000	" 100	5 "	June & Dec.
do	1899 " 99	" 50,000	" 50,000	" 100	6 "	Do
do	1900 " 99	" 100,000	" 100,000	" 100	6 "	Mar. & Sept.
do	1902 " 99	" 100,000	" 100,000	" 100	6 "	Do
do	1903 " 99	" 100,000	" 100,000	" 100	6 "	June & Dec.
do	1902 " 100	" 200,000	" 200,000	" 100	7 "	April & Oct.
Perak Sugar Cultivation Co., Debentures	1897 " 87	" 100,000	" 100,000	" 100	5 "	Do
Shanghai Gas Co., Debentures	1897 " 99	" 1,000,000	" 100,000	" 100	6 "	May & Nov.
do	1899 " 99	" 2,000,000	" 200,000	" 100	6 "	June & Dec.
do	1900 " 99	" 799,800	" 799,800	" 100	6 "	Do
Shanghai and Hongkew Wharf Co., Debentures	1902 " 99	" 500,000	" 500,000	" 100	7 "	Do
Astor House Co., Debentures	Sh. " 102½	H'kow Tls 100,000	H'kow Tls 100,000	" 100	7 "	June & Dec.
British Municipal Council, Hankow	" 96	Tls. 170,000	Tls. 170,000	" 100	6 "	Do
Shanghai Club Debentures	" 97	" 139,000	" 139,000	" 100	6 "	Do
Country Club Debentures	" 97	" 92,000	" 92,000	" 100	6 "	Do
do	1907 " 100	" 110,000	" 110,000	" 100	7 "	Mar. & Sept.
Lane Crawford & Co., Debentures	1907 " 100	" 110,000	" 110,000	" 100	7 "	Do

SINGAPORE SHARE QUOTATIONS

(COURTESY MESSRS. FRASER & CO., BROKERS, SINGAPORE, MAY, 1908)

Date of Formation	Capital	Capital paid up	No. of Shares Issued	Issue Value	Paid up	Reserve	Last Dividend	Name	Buyers	Sellers	Closing Quotations
MINING											
1903	\$300,000	300,000	30,000	10	10	-----	25% for year ending 31-3-07	Belat Tin Mining Co., Ltd.	6.00	6.25	6.25
1907	\$300,000	225,000	22,500y	10	10	-----	20% for year ending 30-4-07	Bruang Ltd.	6.75	7.00	7.00
1901	\$600,000	600,000	60,000	10	10	-----	20% for year ending 30-4-07	Bruseh Hydraulic Tin Mining Co., Ltd.	11.00	11.00	11.00
1903	\$400,000	350,000	350,000a	1	1	-----	2f- during 1907	Duff Development Co., Ltd.	3.15	3.25	3.25
1907	\$400,000	375,000	37,500b	1	1	-----	2f- during 1907	Kanaboi, Ltd.	-----	4.00	4.00
1901	\$60,000	60,000	60,000	1	1	-----	2f- during 1907	Kinta Tin Mines, Ltd.	-----	10.75	10.75
1906	\$100,000	100,000	100,000	1	1	10,000	35% for year ending 31-12-07	Kledang Tin Mining Co., Ltd.	8.50	8.75	8.75
1905	\$150,000	99,000	9,900c	10	10	-----	35% for year ending 31-12-07	Kuantan Tin Mining Co., Ltd.	6.75	7.00	7.00
1906	\$120,000	120,000	120,000	1	1	-----	35% for year ending 31-12-07	Lahat Mines Ltd.	-----	14/6	14/6
1906	\$30,000	30,000	30,000	1	1	-----	35% for year ending 31-12-07	Malaya and Siam Corporation, Ltd.	-----	7.50	7.50
1906	\$450,000	337,500	45,000	10	7.50	-----	35% for year ending 31-12-07	Malacca Tin Dredging Co., Ltd.	28/-	28/6	28/-
1906	\$250,000	179,500	600,000h	5/-	5/-	-----	35% for year ending 31-12-07	Pahang Consolidated Co., Ltd.	-----	nominal.	nominal.
1907	\$100,000	80,000	100,000i	1	1	-----	35% for year ending 31-12-07	Pengkalan, Ltd.	6.25	6.75	6.75
1904	\$120,000	100,000	100,000d	1	1	6,000	45% for year ending 30-6-07	Pusing Lama Tin Mines, Ltd.	-----	5.00	5.00
1907	\$450,000	300,000	30,000h	10	10	-----	45% for year ending 30-6-07	Rahman Hydraulic Tin Mines, Ltd.	10.00	10.25	10.25
1905	\$27,000	21,750	21,750e	1	1	4,873	1f- interim during 1907	Rambutan, Ltd.	6.00	6.25	6.00
1892	\$200,000	191,250	150,000	1	18/10	-----	1f- paid January 1901	Raub Aust. Gold Ming. Co., Ltd. Fully pd.	6.00	6.25	6.00
1905	\$40,000	40,000	40,000	1	1	-----	1f- paid January 1901	Raub Aust. Gold Ming. Co., Ltd. Contributory	6.00	6.25	6.00
1898	Gs 2,500,000	2,500,000	25,000	100	100	-----	1f- paid January 1901	Redhills Tin Mining Co., Ltd.	-----	3.00	3.00
1900	\$110,000	110,000	22,000	5	5	-----	71% for year ending 31-12-07	Redjang Leong Mining Co., Ltd.	0.75	1.00	1.00
1907	\$500,000	500,000	50,000	10	10	-----	10% for 1907	Royal Johore Tin Mining Co., Ltd.	7.75	8.10	8.10
1907	\$80,000	80,000	80,000	1	1	-----	10% for 1907	Salak South, Ltd.	-----	4.00	4.00
1906	\$850,000	850,000	85,000	10	10	25,000	7 1/2% interim for 1908	Sempam Tin Mines, Ltd.	7.50	8.00	8.00
1899	\$230,000	230,000	23,000	10	10	-----	5% for 1/2 year ending 30-6-06	Serendah Hydraulic Tin Ming. Co., Ltd.	4.25	4.50	4.50
1907	\$90,000	70,000	70,000z	1	1	-----	5% for 1/2 year ending 30-6-06	Sipiau Tin Co., Ltd.	-----	9.00	9.00
1902	\$160,000	149,185	149,185f	1	1	-----	5f- during 1907	Tekka, Limited	-----	13.00	13.00
RUBBER											
1905	\$150,000	124,125	46,500g	1	15/-	-----	20% for year ending 31-12-07	Anglo-Malay Rub. Co., Ltd. Fully paid	-----	-----	3.7. 6
1905	\$200,000	105,000	10,500g	10	10	-----	20% for year ending 31-12-07	Anglo-Malay Rub. Co., Ltd. Contributory	-----	16.00	16.00
1904	\$30,000	15,250	7,000i	1	15/-	-----	12 1/4% interim for 1907	Balgownie Rub. Estate Ltd.	-----	2. 15. 0	2. 15. 0
1903	\$70,000	61,000	11,000	1	15/-	-----	12 1/4% interim for 1907	Batu Caves Rub. Co., Ltd. Fully paid	-----	2. 5. 0.	2. 5. 0.
1906	\$150,000	125,000	12,500k	10	10	-----	10% interim for 1907	Batu Caves Rub. Co., Ltd. Contributory	-----	4. 5. 0.	4. 5. 0.
1904	\$12,000	10,500	6,000	1	15/-	-----	10% interim for 1907	Bukit Rajah Rubber Co., Ltd.	-----	9.50	9.50
1905	\$75,000	55,000	55,000l	1	1	8,784	15% interim for 1907	Castlewood Rubber Co., Ltd.	-----	4. 5. 0.	4. 5. 0.
1906	\$310,000	243,227	123,546	1	10/-	-----	15% interim for 1907	Cicely Rubber Estates Co., Ltd.	-----	5. 0. 0.	5. 0. 0.
1906	\$180,000	180,000	180,000	1	1	-----	10% for year ending 31-12-07	Consolidated Malay Rub. Estates, Ltd.	1.16.0	1.17.6	1. 16. 0.
1907	\$320,000	201,500	184,000d	1	5/-	-----	12 1/4% for year ending for 31-12-07	Highlands & Lowds. Para Rub. Co., Ltd.	1.3.6	-----	1. 3. 6.
1906	Gs 175,000	175,000	160	250	250	-----	3% interim for 1907	Kuala Lumpur Rubber Co., Ltd.	-----	1. 2. 6.	1. 2. 6.
1906	\$250,000	225,000	22,500n	10	10	-----	3% interim for 1907	Lanadron Rubber Estates, Ltd.	10/6	11/-	nominal
1895	\$100,000	76,100	900,000e	2/-	2/-	-----	3% interim for 1907	Lanadron Rubber Estates, Ltd. Contributory	-----	250	250
1906	\$300,000	260,625	140,000	1	2/-	-----	3% interim for 1907	Langen Rub. and Coconut Co., Ltd.	-----	250	250
1903	\$30,000	20,000	20,000o	1	1	-----	10% interim for 1907	Ledbury Rubber Co., Ltd.	9/9	10/-	9.50
1906	\$250,000	225,000	22,500b*	10	10	-----	10% interim for 1907	Linggi Plantations Ltd., Ordinary	1.0.0	1.1.6	1.0. 0
1904	\$20,000	8,794	12,412	1	10/-	-----	7 1/2% for year ending 31-12-07	Malacca Rubber Plants, Ltd. 7 1/2% Pref.	9/-	10/-	1.16
1904	\$100,000	99,000	99,000k*	100	100	-----	7 1/2% for year ending 31-12-07	Malacca Rubber Plants, Ltd. Ordinary	-----	-----	nominal.
1898	\$30,000	30,000	300,000	2/-	2/-	-----	35% for year ending 31-12-07	Pataling Rubber Estates Synd. Ltd.	-----	10.00	5. 2. 6
1903	\$250,000	250,000	2,500	100	100	-----	35% for year ending 31-12-07	Ragalla Rubber Co., Ltd.	-----	2. 10. 0.	2. 10. 0.
1905	\$100,000	100,000	10,000	1	1	-----	15% for year ending 31-1-08	Sagga Rubber Company Limited	-----	275.00	15/-
1906	\$100,000	93,357	26,500	1	15/-	-----	25% interim for 1907	Sandycroft Rubber Co., Ltd.	-----	115.00	115.00
1904	\$50,000	41,920	50,000p	1	1	-----	25% interim for 1907	Selangor Rubber Co., Ltd.	100.00	115.00	115.00
1904	\$60,000	50,000	500,000q	2/-	2/-	-----	25% interim for 1907	Singapore & Johore Rub. Co., Ltd.	-----	13.50	13.50
GENERAL											
1894	\$5,377.10.0	4,805	7,688c*	12/6	12/6	1,300	10% for year ending 31-12-6	Bells Asbestos Eastern Agency, Ltd.	-----	132.50	132.50
1898	\$225,000	225,000	4,500	50	50	132,500	15% & 2 1/2% bon. for yr. end. 31-12-07	Fraser & Neave, Ltd.	-----	76 5. 0	76 5. 0
1865	\$15,000,000	15,000,000	120,000	125	125	15,000,000	£2-0-0 on old and £1 10s 0d on new shares for 1/2 year ending 31-12-07	Hongkong & Shanghai Bank'g Corp'n.	-----	135.00	135.00
1905	\$2,400,000	2,400,000	18,000	100	-----	250,000v	7 1/2% for year ending 31-10-07	Howarth Erskine, Ltd.	-----	120.00	120.00
1896	\$1,000,000	1,000,000	6,000	100	-----	600,000	7% for year ending 31-10-07	Katz Brothers, Ltd. Deferred	-----	130.00	130.00
1901	\$34,000	34,000	3,400	10	10	-----	10% for year ending 31-12-07	Katz Brothers, Ltd. Cum. Pref.	-----	150.00 nominal.	150.00 nominal.
1899	\$875,000	875,000	6,000	100	100	-----	8% for year ending 31-10-07	Maynard & Co., Ltd.	-----	19.50	19.50
1903	\$600,000	240,000	24,000r	10	10	20,000	20% for year ending 31-10-07	Riley, Hargreaves & Co., Ltd.	-----	100.00	100.00
1891	\$30,000	30,000	400,000	1	1	-----	5% for year ending 31/12/07	Riley, Hargreaves & Co., Ltd.	-----	107.50	107.50
1903	\$400,000	400,000	4,000	100	100	-----	7% for year ending 31/12/07	Singapore Cold Storage Co., Ltd.	-----	6.00	6.00
1904	\$160,000	112,000	1,120f*	100	100	-----	10% for year ending 31-7-07	Singapore Dispensary Ltd.	5/3	5/6	5/6
1884	\$200,000	200,000	2,000	100	100	-----	5% for year ending 30/6/07	Singapore Electric Tramways, Co., Ltd.	50.00	55.00	50.00
1890	\$500,000	500,000	4,956i*	100	100	458,925w	10% during 1907	Straits Engineering Syndicate Ltd.	-----	130.00	130.00
1904	\$40,000	\$35,350	2,535s	10	10	-----	10% for year ending 31-12-07	Straits Ice Co., Ltd.	190.00	195.00	195.00
1887	\$3,000,000	3,000,000	300,000	10	10	1,150,000	10% & 5% bon. for 1/2 yr. end. 30-9-07	Straits Steam Ship Co., Ltd.	-----	2.50	2.50
DEBENTURES											
a	50,000 unissued		n	2,500 unissued.		a*	5,000 unissued.	Howarth Erskine, Ltd. 6%	-----	3%	3% prem.
b	2,500		o	10,000		b*	2,500	Riley, Hargreaves & Co., Ltd. 6%	-----	3%	3% prem.
c	5,100		p	8,080		c*	916	Singapore Electric Tramways, Co., Ltd. 5%	-----	-----	nominal
d	20,000		q	100,000		d*	66,000	Singapore Municipal 6%	-----	-----	20% prem.
e	5,250		r	36,000		e*	239,000	" " 5%	3%	-----	3% prem.
f	10,815		s	465		f*	480	" " 4 1/2%	-----	5%	5% prem.
h	100,000	Ord.	t	Special Gold Reserve Fund		g*	9,500	" " 4%	10%	-----	10% dis. nom.
i	45,500	Pref.	u	Silver Reserve Fund.		h*	15,000	Straits Engineering Synd. Ltd. 6%	-----	-----	par.
j	12,000		v	Insurance Fund.		i*	44	Tanjong Pagar Dock Board 5%	par.	-----	par.
k	9,000		w	Sundry Reserves.		j*	20,000				
l	2,500		x	Sundry Reserves.		k*	10				
m	20,000		y	7,500 unissued.							
	5,000		z	20,000							

YOKOHAMA SHARE QUOTATIONS

COURTESY A. C. HUTTON POTTS, SHARE AND GENERAL BROKER, YOKOHAMA, MAY, 1908

STOCKS	CAPITAL.	NO. OF SHARES	ISSUE VALUE	AMOUNT PAID UP	RESERVE FUND	AT WORKING ACCOUNT OR CARRIED FORWARD	DATE	LAST DIVIDEND	FOR TERM	CLOSING QUOTATION
Brett & Co., Ltd.	-Y- 28,000	2800	-Y- 10	-Y- 10		-Y- 943.52	31-12-06	10%	for 1 year	10 Sellers.
Club Hotel, Ltd.	185,000	1850	100	100	3,000	-Y- 8,762.67	31-3-07	10%	for 1 year	75 Sellers.
Grand Hotel, Ltd.	500,000	5000	100	100	10,000	-Y- 1,682.93	31-12-07	5%	for 1 year	100 Sellers.
Helm Bros., Ltd.	186,000	3720	50	50	25,000	Dr. 14,115.95	31-12-07	20%	for 1 year	80 Sellers.
Langfeldt & Co., Ltd.	150,000	1500	100	100		1,729.20	31-10-07	20%	for 1 year	45 Sales.
C. Nickel & Co., Ltd.	500,000	20000	25	25		-Y- 12,477.04	31-5-07	10%	for 1 year	42 Sellers.
Yokohama Engine and Iron Works	500,000	10000	50	50	50,000		31-8-06	15%	for 1 year	80 Sellers.
Oriental Hotel, Ltd., Ordinary	250,000	3000	50	50	62,285.42					50 Nominal.
Oriental Hotel Ltd., Preference	250,000	2000	50	50				8%	for 1 year	50 Nominal.
The Union Estate and Investment Co., Ltd.	1,000,000	10000	100	100	3,259.65	1,774.45	30-9-07	7%	9 mos.	100 Nominal.

† 285,000 unissued.
‡ 475,000 unissued.

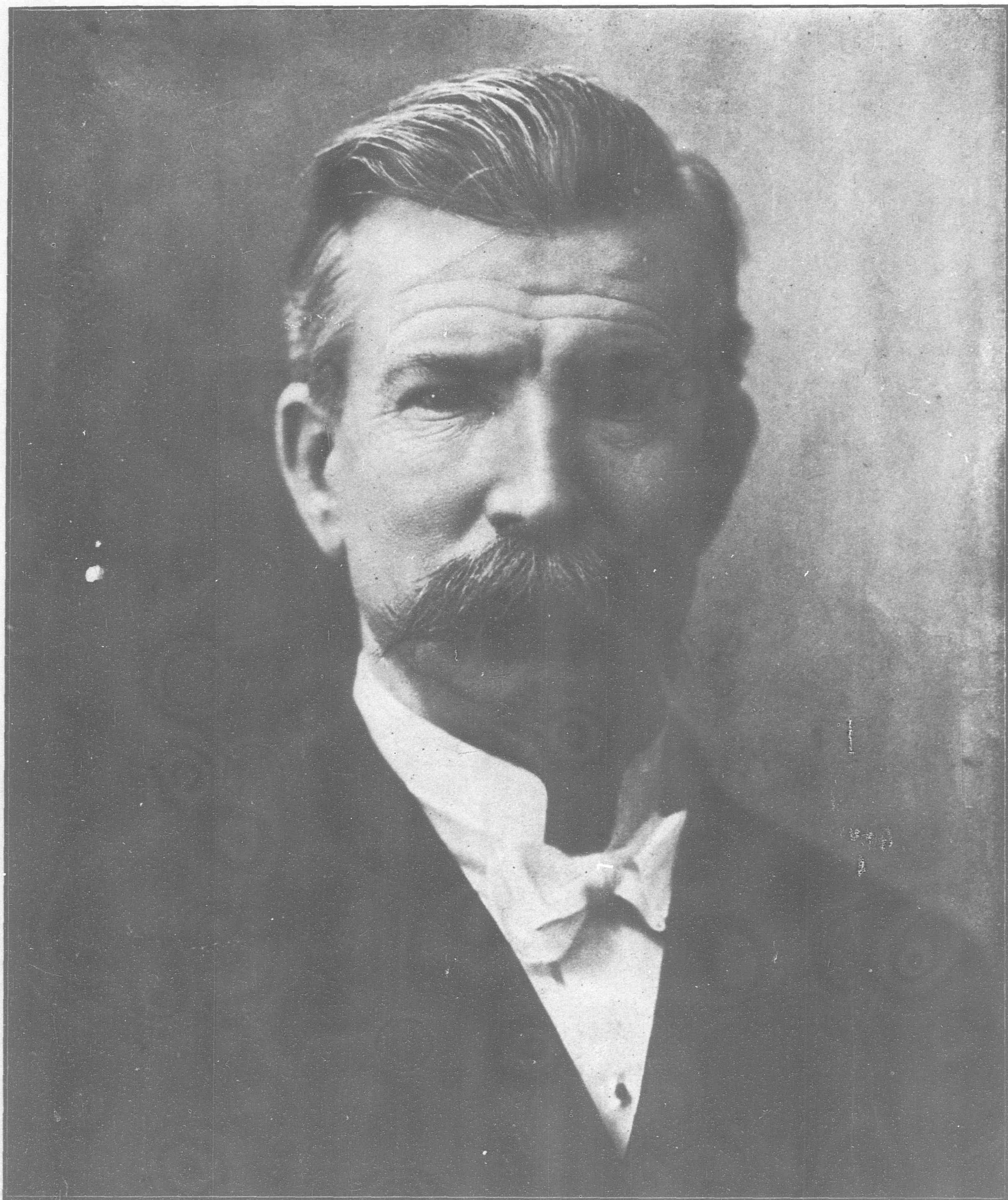
*-Y- 390,000 issued.
110,000 unissued.

DEBENTURE LOANS	AMOUNT OF LOAN.	FACE VALUE OF DEBENTURES.	RATE OF INTEREST.	INTEREST PAYABLE.	CLOSING QUOTATION.
Brett & Company, Limited.	11,500.00	100.00	7%	1 June and 1 Dec.	95 Sales.
Yokohama United Club.	250,000.00	100.00	7%	30 June and 31 Dec.	100 Sales.
C Nickel & Company, Limited.	50,000.00	100.00	8%	1 May and 1 Nov.	110 Sellers.
Oriental Hotel, Limited.	250,000.00	100.00	8%	1 April and 1 Oct.	400 Sellers.
Union Estate and Investment Co., Limited.	250,000.00	100.00	6%	30 June and 31 Dec.	100 Sellers.

JAPANESE STOCKS.	FACE VALUE.	AMOUNT PAID UP.	LAST DIVIDEND	DIVIDEND PAYABLE.	CLOSING QUOTATION.
Bonds & Debentures.					
Exchequer Bonds 1st issue.	-Y-100	-Y-100	5%	June and Dec.	-Y-101.30
Exchequer Bonds 2nd issue.	100	100	5%	March and Sept.	" 94.40
Exchequer Bonds 3rd issue.	100	100	5%	March and Sept.	" 92.60
Consolidated Bonds (Seiri).	100	100	5%	June and Dec.	" 80.30
War Bonds (Gunji).	100	100	5%	June and Dec.	" 80.30
Imperial 5% Bonds	100	100	5%	March and Sept.	" 80.00
Special 5% Bonds (issued 1906).	100	100	5%	June and Dec.	" 81.20
Yokohama Water Works Bonds.	100	100	6%	June and Dec.	" 94.50
Yokohama City Public Loan Bonds.	100	100	6%	March and Sept.	" 93.80
Osaka Harbour Bonds.	100	100	6%	June and Dec.	" 89.00
Osaka City Public Loan Bonds.	100	100	6%	June and Dec.	" 92.50
Kawasaki Dock Yards Co.'s Debentures	100	100	7%	June and Dec.	" 95.00
Tokyo Race Associations.	500	500	30%	June and Dec.	" 500.00
Railways & Electric Trams.					
Tokyo Railway Company Limited.	50	50	8%	June and Dec.	" 56.45
Yokohama Electric Tramway Company, Limited.	50	50	6%	July and Jan.	" 36.00
Keihin Electric Tramway Company, Limited.	50	50	13%	June and Dec.	" 63.50
Southern Manchurian Railway Co., Ltd.	100	20	6%	June and Dec.	" 23.00
Hanshin Electric Tramway Co., Ltd.	50	50	12%	May and Nov.	" 85.50
Cotton Spinnings.					
Kanegafuchi Cotton Spinning Company, Limited.	50	50	22%	July and Jan.	" 76.30
Fuji Gassed-Yarn Company, Limited.	50	50	25%	July and Jan.	" 73.50
Tokyo Cotton Spinning Company, Limited.	50	50	18%	July and Jan.	" 31.70
Imperial Hemp Weaving Company, Limited.	50	50	12%	July and Jan.	" 50.00
Nisshin Boseki Kabushiki Kaisha.	50	12½			" 6.10
Sugar & Beer Cos.					
Dai-nippon Sugar Refinery Company, Limited.	50	50	17½%	May and Nov.	" 61.65
Ensuiko Sugar Refinery Company, Limited.	50	12½	18%	June and Dec.	" 14.00
Dai-nippon Beer Company, Limited.	50	50	15%	July and Jan.	" 76.10
Kirin Brewery Company, Limited.	50	50	8%	July and Jan.	" 56.00
Docks & Steamships.					
Yokohama Dock Company, Limited.	50	33	12%	June and Dec.	" 48.50
Uraga Dock Company, Limited.	50	50		July and Jan.	" 7.00
Kawasaki Dockyard Company, Limited.	50	50	12½%	Feb. and Aug.	" 65.00
Nippon Yusen Kaisha.	50	50	12%	May and Nov.	" 79.40
Hokkaido Tanko S. S. Company, Limited.	50	50	14%	July and Jan.	" 81.10
Miscellaneous.					
Tokyo Electric Light Company, Limited.	50	50	10%	June and Dec.	" 65.00
Tokyo Gas Company, Limited.	50	50	15%	July and Jan.	" 80.00
Yokohama Union Electric Light Company, Limited.	50	50	15%	July and Jan.	" 69.00
Fuji Paper Mills.	50	50	10%	June and Dec.	" 43.00
Otaru Timber Company, Limited.	50	50	15%	March and Sept.	" 17.00
Hoden Petroleum Company, Limited.	50	50	36%	April and Oct.	" 103.50
Tokyo Rope Manufacturing Company, Limited.	50	50	20%	June and Dec.	" 90.00
Japan Horse Improvement Company, Limited.	50	50	15%	March and Sept.	" 38.50
Tokyo Stock Exchange Company.	50	50	11%	June and Dec.	" 99.25
Osaka Electric Light Company, Limited.	50	50	15%	July and Jan.	" 101.00
Kobe Electric Light Company, Limited.	50	50	14%	July and Jan.	" 69.00

BANGKOK QUOTATIONS

NAME.	BUYERS.	SELLERS.	QUOTATION.	ESTABLISHED.	CAPITAL.	NO. OF SHARES.	ISSUE VALUE.	AMOUNT PAID UP.	RESERVE FUND	LAST DIVIDEND	WHEN PAID OR PAYABLE.
Siam Electricity Co., Ltd.	Tes. —	Tes. 505	Tes. 505	1901	£ 300,000	30,000	£ 10	£ 300,000	Tes. 418,174.31	12% & 12½ T. bon.	Feb. 29, 1908
Paknam Railway Co., Ltd.	" 200	" —	" 210	1893	Tes. 400,000	5,000	Tes. 80	Tes. 400,000	" 80,000	6% & 2 Tel. bonus for 1 year ending 2%	Dec. 31, 1906
Siam Tramway Co., Ltd.	" 160	" 168	" 168	1905	" 1,450,000	6250 Shares 7250 Deb. 1000 P. Shares	" 100	" 1,450,000	—		Mar. 31, 1907
Meklong Railway Co., Ltd.	" 124	" 127	" 129	July 12, 1907	" 2,230,000	22,300	" 100	" 2,230,000	17,316.22	2½%	Dec. 31, 1907
Bangkok Manufact. Co., Ltd.	" 145	" —	" 160	1898	" 400,000	4,000	" 100	" 400,000	—	None	June 30, 1907
Howarth Erskine, Ltd.	" —	" —	" 235	1905	\$ 2,400,000	24,000	\$ 100	\$ 2,400,000	\$ 40,000	7½%	Dec. 31, 1907
Bangkok Dock Co., Ltd.	" —	" —	" 305	1865	Tes. 666,666	4,000	Tes. 166½	Tes. 666,666	Tes. 270,000	12½% & 2½ Bonus	Dec. 31, 1907
Siam Steam Packet Co.	" —	" 100	" 100	1898	" 131,250	2,625	" 50	" 131,250	" 36,000	14%	Dec. 31, 1907
Siam Commercial Bank	" 1,350	" 1,450	" 1,450	1906	" 3,000,000	3,000	" 1,000	" 3,000,000	" 140,000	2½%	Sept. 30, 1907
Menam Motor Boat Co.	" 130	" —	" 140	1905	" 200,000	2,000	" 100	" 125,000	—	5%	July 31, 1907
Jenderata Rubber Co.	" 65	" 70	" 70	1906	£ 40,000	4,000	£ 10	£ 3, per Share	—	None	—
Langsuan Tin Mine Co.	" —	3/	4/	1905	£ 170,000	170,000	£ 1	£ 60,000	—	—	—



Hon. Luke E. Wright
Secretary of War for the United States of America